

The tests that comprise the PondCare Master Liquid Test Kit have changed, so this packet contains Material Safety Data Sheets that may not pertain to the kit in your possession.

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 1 of 7

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

POND CARE WIDE RANGE PH TEST SOLUTION

STATEMENT OF HAZARDOUS NATURE

Not considered a hazardous substance according to OSHA 29
CFR 1910.1200.

SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated
Address:
PO Box 218
Chalfont
PA, 18914-0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

PRODUCT USE

pH test solution for product 160.

SYNONYMS

"Solution ID# 3313"

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
non hazardous ingredients		100

Section 3 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS

None

EMERGENCY OVERVIEW

RISK

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality

continued...

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 2 of 7
Section 3 - HAZARDS IDENTIFICATION

(death) rather than those producing morbidity (disease, ill-health).
Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

EYE

Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.

Section 4 - FIRST AID MEASURES

SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

- If this product comes in contact with eyes:
- Wash out immediately with water.
 - If irritation continues, seek medical attention.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin or hair contact occurs:
- Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN

Treat symptomatically.

continued...

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 3 of 7

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable
Lower Explosive Limit (%): Not Applicable
Upper Explosive Limit (%): Not Applicable
Autoignition Temp (°F): Not Applicable

EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.
Use extinguishing media suitable for surrounding area.

FIRE FIGHTING

- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered to be a significant fire risk.
- Expansion or decomposition on heating may lead to violent rupture of containers.
- Decomposes on heating and may produce toxic/ irritating fumes.
- May emit acrid smoke.

FIRE INCOMPATIBILITY

None known.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Control personal contact by using protective equipment.
- Prevent spillage from entering drains, sewers or water courses.
- Recover product wherever possible.
- Put residues in labeled containers for disposal.
- If contamination of drains or waterways occurs, advise emergency services.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGLE) (in ppm)

AEGLE 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could

continued...

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 4 of 7

Section 6 - ACCIDENTAL RELEASE MEASURES

experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Not available. Refer to individual constituents.

PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

When handling larger quantities:

General purpose rubber glove.

Respirator:

continued...

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 5 of 7

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

Wear general protective gloves, e.g.. light weight rubber gloves.

OTHER

No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Miscible
pH (1% solution): Not Available
Volatile Component (%vol): Not Available
Relative Vapor Density (air=1): Not Available
Lower Explosive Limit (%): Not Applicable
Autoignition Temp (°C): Not Applicable
State: Liquid

Boiling Range (°C): Not Available
Specific Gravity (water=1): 0.994
pH (as supplied): 7.10-8.25
Vapor Pressure (kPa): Not Available
Evaporation Rate: Not Available
Flash Point (°C): Not Applicable
Upper Explosive Limit (%): Not Applicable
Decomposition Temp (°C): Not Available

APPEARANCE

Dark green solution with a slight odor; mixes with water.

continued...

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 6 of 7

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

Avoid contamination of water, foodstuffs, feed or seed.

Section 11 - TOXICOLOGICAL INFORMATION

Pond Care Wide Range pH Test Solution

Not available. Refer to individual constituents.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

Section 12 - ECOLOGICAL INFORMATION

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

DOT Information

Shipping Name: None

Hazard Class: None

SubRisk: None

UN/NA Number: None

Packing Group: None

Additional Shipping Information:

International Transport Regulations:

IMO: None

continued...

POND CARE WIDE RANGE PH TEST SOLUTION

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-5
CD 2005/3 Page 7 of 7

Section 15 - REGULATORY INFORMATION

RISK

US Federal Regulations

A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

Component TSCA

State Regulations

A. General Product Information

B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component CAS No CA FL MA MN NJ PA

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

Other Regulations

A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

B. Component Information

CANADA

All of this product's components are on the Canadian Domestic

Section 16 - OTHER INFORMATION

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LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 1 of 12

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

LIQUID AMMONIA TEST SOLUTION #1

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

SUPPLIER

Company: Aquarium Pharmaceuticals Inc
Address:
PO Box 218
Chalfont
PA, 18914- 0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

Company: Aquarium Pharmaceuticals Inc
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181
Fax: +1 215 822 1906

PRODUCT USE

Ammonia test solution for product LR8600, 34 and 401M.

SYNONYMS

"Solution ID# 3335A"

Section 2 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Ingestion may produce health damage*.
Cumulative effects may result following exposure*.
Possible respiratory sensitizer*.
Possible skin sensitizer*.
May be harmful to the fetus/ embryo*.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual.
Large oral doses of salicylates may cause mild burning pain in the throat, stomach and

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 2 of 12
Section 2 - HAZARDS IDENTIFICATION

usually prompt vomiting. Several hours may elapse before the development of deep and rapid breathing, lassitude, anorexia, nausea, vomiting, thirst and occasional diarrhoea. Common derivatives of salicylic acid produce substantially the same toxic syndrome, ("salicylism"). Major signs and symptoms arise from stimulation and terminal depression of the central nervous system. Stimulation produces vomiting, hyperpnea (abnormal increase in rate and depth of respiration), headache, tinnitus (ringing in the ears) confusion, bizarre behaviour or mania, generalised convulsions. Death is due to respiratory failure or cardiovascular collapse. Severe sensory disturbances such as deafness and dimness of vision are common. Less common features include sweating, skin eruptions, gastrointestinal and other hemorrhages, renal failure and pancreatitis. A tendency to bleed may be manifest by blood in the vomitus (haematemesis), bloody stools (melena) or purplish-red spots (petechiae) on the skin. Many of the toxic effects detailed here are due to or aggravated by severe disturbance of acid-base balance with the chief cause being prolonged hyperventilation from central stimulation. An assessment of acute salicylate intoxication based on dose suggests; 500 mg/mg: Potentially lethal.

EYE

Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product. Inhalation hazard is increased at higher temperatures.

CHRONIC HEALTH EFFECTS

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Limited evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a significant number of individuals at a greater frequency than would be expected from the response of a normal population.

Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking.

There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.

There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects. Chronic exposure to the salicylates (o-hydroxybenzoates) may produce metabolic and central system disturbances or damage to the kidneys. Persons with pre-existing skin

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 3 of 12
Section 2 - HAZARDS IDENTIFICATION

disorders, eye problems or impaired kidney function may be more susceptible to the effects of these substances. Certain individuals (atopics), notably asthmatics, exhibit significant hyper- sensitivity to salicylic acid derivatives. Reactions include urticaria and other skin eruptions, rhinitis and severe (even fatal) bronchospasm and dyspnea. Chronic exposure to the p-hydroxybenzoates (parabens) is associated with hypersensitivity reactions following application of these to the skin. Hypersensitivity reactions have also been reported following parenteral or oral administration. Cross-sensitivity occurs between the p-hydroxybenzoates Hypersensitivity reactions may include by acute bronchospasm, hives (urticaria), deep dermal wheals (angioneurotic oedema), running nose (rhinitis) and blurred vision. Anaphylactic shock and skin rash (non- thrombocytopenic purpura) may also occur. Any individual may be predisposed to such anti-body mediated reaction if other chemical agents have caused prior sensitisation (cross-sensitivity).

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
polyethylene glycol	25322-68-3	<90
sodium salicylate	54-21-7	<10

Section 4 - FIRST AID MEASURES

SWALLOWED

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN

Treat symptomatically.

for salicylate intoxication:

- Pending gastric lavage, use emetics such as syrup of Ipecac or delay gastric emptying and absorption by swallowing a slurry of activated charcoal. Do not give ipecac after

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 4 of 12
Section 4 - FIRST AID MEASURES

charcoal.

- Gastric lavage with water or perhaps sodium bicarbonate solution (3%-5%). Mild alkali delays salicylate absorption from the stomach and perhaps slightly from the duodenum.
- Saline catharsis with sodium or magnesium sulfate (15-30 gm in water).
- Take an immediate blood sample for an appraisal of the patient's acid-base status. A pH determination on an anaerobic sample of arterial blood is best. An analysis of the plasma salicylate concentration should be made at the same time. Laboratory controls are almost essential for the proper management of severe salicylism.
- In the presence of an established acidosis, alkali therapy is essential, but at least in an adult, alkali should be withheld until its need is demonstrated by chemical analysis. The intensity of treatment depends on the intensity of acidosis. In the presence of vomiting, intravenous sodium bicarbonate is the most satisfactory of all alkali therapy.
- Correct dehydration and hypoglycaemia (if present) by the intravenous administration of glucose in water or in isotonic saline. The administration of glucose may also serve to remedy ketosis which is often seen in poisoned children.
- Even in patients without hypoglycaemia, infusions of glucose adequate to produce distinct hyperglycaemia are recommended to prevent glucose depletion in the brain. This recommendation is based on impressive experimental data in animals.
- Renal function should be supported by correcting dehydration and incipient shock. Overhydration is not justified. An alkaline urine should be maintained by the administration of alkali if necessary with care to prevent a severe systemic alkalosis. As long as urine remains alkaline (pH above 7.5), administration of an osmotic diuretic such as mannitol or perhaps THAM is useful, but one must be careful to avoid hypokalaemia. Supplements of potassium chloride should be included in parenteral fluids.
- Small doses of barbiturates, diazepam, paraldehyde, or perhaps other sedatives (but probably not morphine) may be required to suppress extreme restlessness and convulsions.
- For hyperpyrexia, use sponge baths.

The presence of petechiae or other signs of haemorrhagic tendency calls for a large Vitamin K dose and perhaps ascorbic acid. Minor transfusions may be necessary since bleeding in salicylism is not always due to a prothrombin effect.

- Haemodialysis and haemoperfusion have proved useful in salicylate poisoning, as have peritoneal dialysis and exchange transfusions, but alkaline diuretic therapy is probably sufficient except in fulminating cases.

[GOSSELIN, et.al.: Clinical Toxicology of Commercial Products]

The mechanism of the toxic effect involves metabolic acidosis, respiratory alkalosis, hypoglycaemia, and potassium depletion. Salicylate poisoning is characterised by extreme acid-base disturbances, electrolyte disturbances and decreased levels of consciousness.

There are differences between acute and chronic toxicity and a varying clinical picture which is dependent on the age of the patient and their kidney function. The major feature of poisoning is metabolic acidosis due to "uncoupling of oxidative phosphorylation" which produces an increased metabolic rate, increased oxygen consumption, increased formation of carbon dioxide, increased heat production and increased utilisation of glucose. Direct stimulation of the respiratory centre leads to hyperventilation and respiratory alkalosis. This leads to compensatory increased renal excretion of bicarbonate which contributes to the metabolic acidosis which may coexist or develop subsequently.

Hypoglycaemia may occur as a result of increased glucose demand, increased rates of tissue glycolysis, and impaired rate of glucose synthesis. NOTE: Tissue glucose levels may be lower than plasma levels. Hyperglycaemia may occur due to increased glycogenolysis. Potassium depletion occurs as a result of increased renal excretion as well as intracellular movement of potassium.

Salicylates competitively inhibit vitamin K dependent synthesis of factors II, VII, IX, X and in addition, may produce a mild dose dependent hepatitis. Salicylates are bound to albumin. The extent of protein binding is concentration dependent (and falls with higher blood levels). This, and the effects of acidosis, decreasing ionisation, means that the volume of distribution increases markedly in overdose as does CNS penetration. The extent of protein binding (50-80%) and the rate of metabolism are concentration dependent. Hepatic clearance has zero order kinetics and thus the therapeutic half-life of 2-4.5 hours but the half-life in overdose is 18-36 hours. Renal excretion is the most important

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 5 of 12
Section 4 - FIRST AID MEASURES

route in overdose. Thus when the salicylate concentrations are in the toxic range there is increased tissue distribution and impaired clearance of the drug.
HyperTox 3.0 <http://www.ozemail.com.au/-ouad/SALI0001.HTA>.

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable
Lower Explosive Limit (%): Not Applicable
Upper Explosive Limit (%): Not Applicable
Autoignition Temp (°F): Not Applicable

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:

Safety Glasses.

Chemical goggles.

Gloves:

PVC chemical resistant type.

Respirator:

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 6 of 12

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin.

DO NOT USE brass or copper containers / stirrers.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 7 of 12
Section 7 - HANDLING AND STORAGE

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Canada - Saskatchewan Occupational Health and Safety Regulations - Contaminant Limits	polyethylene glycol (Respirable size+)		3		6			
Canada - Saskatchewan Occupational Health and Safety Regulations - Contaminant Limits	polyethylene glycol (Particulates, NOC++)		10		20			
Canada - British Columbia Occupational Exposure Limits	polyethylene glycol (Particles Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC)		10					

The following materials had no OELs on our records

- sodium salicylate: CAS:54- 21- 7

MATERIAL DATA

Not available. Refer to individual constituents.

INGREDIENT DATA

POLYETHYLENE GLYCOL:

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 8 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

For powdered forms:

The polyethylene glycols are extremely low in oral toxicity, are not significantly irritating to the eyes or skin, and are not absorbed through the skin in toxic amounts. vapour pressures are extremely low and inhalation exposure is limited to mists. Based on experimental data and human experience, these substances do not present significant hazards to health in the workplace.

SODIUM SALICYLATE:

CEL TWA: 5 mg/m³ [as analogue for aspirin]

PERSONAL PROTECTION

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 9 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.

Molecular Weight: Not Applicable

Melting Range (°F): Not Available

Solubility in water (g/L): Miscible

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapor Density (air=1): Not Available

Lower Explosive Limit (%): Not Applicable

Autoignition Temp (°F): Not Applicable

State: Liquid

Boiling Range (°F): Not Available

Specific Gravity (water= 1): 1.152

pH (as supplied): 8.3

Vapor Pressure (mmHg): Not Available

Evaporation Rate: Not Available

Flash Point (°F): Not Applicable

Upper Explosive Limit (%): Not Applicable

Decomposition Temp (°F): Not Available

Viscosity: Not Available

APPEARANCE

Reddish-orange liquid with a mild odour; mixes with water.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.

Section 11 - TOXICOLOGICAL INFORMATION

Liquid Ammonia Test Solution #1

TOXICITY AND IRRITATION

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

POLYETHYLENE GLYCOL:

TOXICITY

Oral (rat) LD50: 33750 mg/kg

for molecular weights (200-8000) *

IRRITATION

Skin (rabbit): 500mg/24h - mild.

Eye (rabbit): 500mg/24h - mild.

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 10 of 12
Section 11 - TOXICOLOGICAL INFORMATION

Oral (rat) LD50: 31000->50000 mg/kg
Oral (mice) LD50: 38000->50000 mg/kg
Oral (g.pig) LD50: 17000->50000 mg/kg
Oral (rabbit) LD50: 14000->50000 mg/kg
Intraperitoneal (mice) LD50: 3100-12900 mg/kg

* AIHA WEEL Guides

SODIUM SALICYLATE:

TOXICITY

Oral (human) LDLo: 700 mg/kg
Oral (rat) LD50: 1200 mg/kg
Intraperitoneal (rat) LD50: 542 mg/kg
Subcutaneous (rat) LD50: 980 mg/kg

IRRITATION

Nil Reported

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.
Refer to data for ingredients, which follows:

POLYETHYLENE GLYCOL:

BOD 5 if unstated: 0-0.02,1%
COD: 1.62-1.74,98%
Toxicity Fish: TLm(96)>10000mg/L

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction,
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 11 of 12

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA,
IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

polyethylene glycol (CAS: 25322-68-3) is found on the following regulatory lists;
Canada - British Columbia Occupational Exposure Limits
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
Canada Domestic Substances List (DSL)
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
US - Minnesota Hazardous Substance List
US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications
US DOE Temporary Emergency Exposure Limits (TEELs)
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk
Liquid Cargoes
US EPA High Production Volume Program Chemical List
US Food Additive Database
US Premarket Notifications for Food Contact Substances
US Toxic Substances Control Act (TSCA) - Inventory

sodium salicylate (CAS: 54-21-7) is found on the following regulatory lists;
Canada Domestic Substances List (DSL)
Canada Environmental Quality Guidelines (EQGs) Water: Aquatic life
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous
Substances List
US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications
US DOE Temporary Emergency Exposure Limits (TEELs)
US EPA High Production Volume Program Chemical List
US Toxic Substances Control Act (TSCA) - Inventory

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

Ingestion may produce health damage*.
Cumulative effects may result following exposure*.
Possible respiratory sensitiser*.
Possible skin sensitiser*.
May be harmful to the foetus/ embryo*.
* (limited evidence).

EXPOSURE STANDARD FOR MIXTURES

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and
concentration:

Composite Exposure Standard for Mixture (TWA) :5 mg/m³.

Operations which produce a spray/mist or fume/dust, introduce particulates to the
breathing zone.

If the breathing zone concentration of ANY of the components listed below is exceeded,

continued...

LIQUID AMMONIA TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Jun-5-2007
NB293ECP

CHEMWATCH 4650-12
Version No:4
CD 2007/2 Page 12 of 12
Section 16 - OTHER INFORMATION

"Worst Case" considerations deem the individual to be overexposed.

Component	Breathing Zone ppm	Breathing Zone mg/m ³	Mixture Conc (%)
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Component	Breathing Zone (mg/m ³)	Mixture Conc (%)
sodium salicylate	5.0000	10.0

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LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 1 of 15

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

LIQUID AMMONIA TEST SOLUTION #2

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated
Address:
PO Box 218
Chalfont
PA, 18914-0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

PRODUCT USE

Ammonia test solution for product LR8600, 34 and 401M.

SYNONYMS

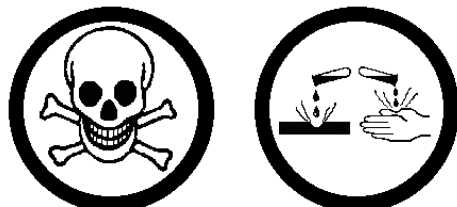
"Solution ID# 3335B"

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
sodium hydroxide	1310-73-2	<10
sodium hypochlorite	7681-52-9	<1

Section 3 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Causes severe burns.
Risk of serious damage to eyes.
Harmful to aquatic organisms.
Ingestion may produce health damage*.
*(limited evidence)

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 2 of 15
Section 3 - HAZARDS IDENTIFICATION

Cumulative effects may result following exposure*.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual.

The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Ingestion of alkaline corrosives may produce burns around the mouth, ulcerations and swellings of the mucous membranes, profuse saliva production, with an inability to speak or swallow. Both the esophagus and stomach may experience burning pain; vomiting and diarrhea may follow. Epiglottal swelling may result in respiratory distress and asphyxia; shock can occur. Narrowing of the esophagus, stomach or stomach valve may occur immediately or after a long delay (weeks to years). Severe exposure can perforate the esophagus or stomach leading to infections of the chest or abdominal cavity, with low chest pain, abdominal stiffness and fever. All of the above can cause death.

EYE

The material can produce severe chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.

If applied to the eyes, this material causes severe eye damage.

Direct eye contact with corrosive bases can cause pain and burns. There may be swelling, epithelium destruction, clouding of the cornea and inflammation of the iris. Mild cases often resolve; severe cases can be prolonged with complications such as persistent swelling, scarring, permanent cloudiness, bulging of the eye, cataracts, eyelids glued to the eyeball and blindness.

SKIN

The material can produce severe chemical burns following direct contact with the skin.

Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

If inhaled, this material can irritate the throat and lungs of some persons.

Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane. In severe cases, lung swelling may develop, sometimes after a delay of hours to days. There may be low blood pressure, a weak and rapid pulse, and crackling sounds.

CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Substance

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 3 of 15
Section 3 - HAZARDS IDENTIFICATION

accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Center or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

EYE

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
- Transport to hospital, or doctor.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision,

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 4 of 15
Section 4 - FIRST AID MEASURES

cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilization of proteins allow deep penetration into the tissue.
Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents
No more than 2 glasses of water should be given to an adult.
- Neutralizing agents should never be given since exothermic heat reaction may compound injury.
* Catharsis and emesis are absolutely contra-indicated.
* Activated charcoal does not absorb alkali.
* Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable
Lower Explosive Limit (%): Not Applicable
Upper Explosive Limit (%): Not Applicable
Autoignition Temp (°F): Not Applicable

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 5 of 15
Section 5 - FIRE FIGHTING MEASURES

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 2625 feet in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
 - Not considered to be a significant fire risk, however containers may burn.
- May emit corrosive fumes.

FIRE INCOMPATIBILITY

None known.

Section 6 - ACCIDENTAL RELEASE MEASURES

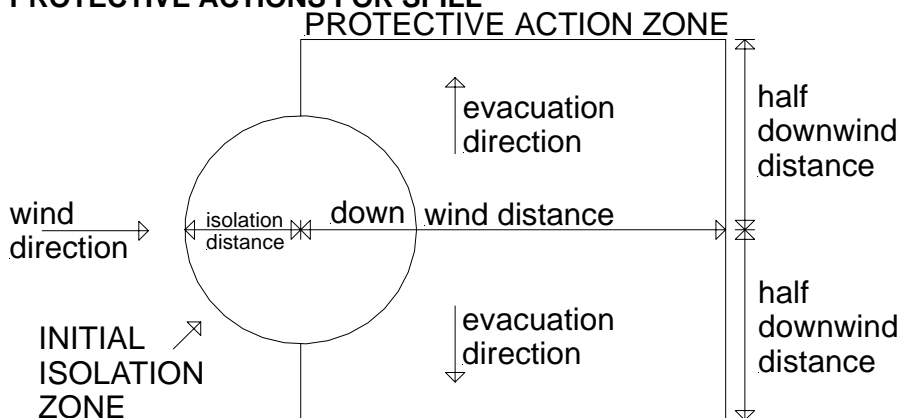
MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet

Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9

CD 2005/3 Page 6 of 15

Section 6 - ACCIDENTAL RELEASE MEASURES

Isolation Distance	25 meters
Downwind Protection Distance	250 meters

FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

sodium hydroxide	50 mg/m ³
sodium hypochlorite	500 mg/m ³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 7 of 15
Section 6 - ACCIDENTAL RELEASE MEASURES

sodium hydroxide 5 mg/m³
sodium hypochlorite 500 mg/m³

other than mild, transient adverse effects
without perceiving a clearly defined odour is:

sodium hydroxide 0.5 mg/m³
sodium hypochlorite 75 mg/m³

The threshold concentration below which most people
will experience no appreciable risk of health effects:

sodium hydroxide 0.5 mg/m³
sodium hypochlorite 25 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.
 - Use in a well-ventilated area.
 - WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
 - Avoid smoking, naked lights or ignition sources.
 - Avoid contact with incompatible materials.
 - When handling, DO NOT eat, drink or smoke.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately.
 - Launder contaminated clothing before re-use.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.

RECOMMENDED STORAGE METHODS

- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 8 of 15
Section 7 - HANDLING AND STORAGE

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges may be used.

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting molded plastic box and the substances are not incompatible with the plastic.

STORAGE REQUIREMENTS

- Store in original containers.
 - Keep containers securely sealed.
 - Store in a cool, dry, well-ventilated area.
 - Store away from incompatible materials and foodstuff containers.
 - Protect containers against physical damage and check regularly for leaks.
 - Observe manufacturer's storing and handling recommendations.
- DO NOT store near acids, or oxidizing agents.
Protect containers against physical damage.
Check regularly for spills and leaks.
No smoking, naked lights, heat or ignition sources.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)
Z1	Sodium hydroxide		2							

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³
US California Permissible Exposure Limits for Chemical Contaminants	Sodium hydroxide; caustic soda					--	2
US Minnesota Permissible Exposure Limits (PELs)	Sodium hydroxide						2
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Sodium hydroxide		2				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Sodium hydroxide						2

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
 Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
 CD 2005/3 Page 9 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Sodium hydroxide				2
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Sodium hydroxide				2.00000
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Sodium hydroxide	-	2	-	-
US Washington Permissible exposure limits of air contaminants	Sodium hydroxide				2
Canadian British Columbia Occupational Exposure Limits	Sodium hydroxide				2
NIOSH Recommended Exposure Limits for Hazardous Agents in the Workplace	Sodium hydroxide				2
US AIHA Workplace Environmental Exposure Levels (WEELs)	Sodium Hypochlorite				2
No data available: sodium hypochlorite as (CAS: 10022-70-5)					

Not available. Refer to individual constituents.

EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of vapour components/concentrations:

"Worst Case" computer-aided prediction of vapour components/concentrations:
 Composite Exposure Standard for Mixture (TWA) (mg/m³): 1.5 mg/m³

"Worst Case" computer-aided prediction of vapour components/concentrations:
 Composite Exposure Standard for Mixture (TWA) (mg/m³):

If the breathing zone concentration of ANY of the components listed below is exceeded, "Worst Case" considerations deem the individual to be overexposed.
 Component Breathing Zone ppm Breathing Zone mg/m³ Mixture Conc: (%)

Component	Breathing zone (ppm)	Breathing Zone (mg/m ³)	Mixture Conc (%)
sodium hypochlorite	0.50	1.5000	1.0

INGREDIENT DATA

SODIUM HYDROXIDE:

The TLV-C is recommended based on concentrations that produce noticeable but not excessive, ocular and upper respiratory tract irritation.

SODIUM HYPOCHLORITE:

available chlorine, as chlorine
 TLV TWA: 0.5 ppm, 1.5 mg/m³; STEL: 1 ppm, 2.9 mg/m³
 ES Peak: 1 ppm, 3 mg/m³
 CEL TWA: 2 mg/m³ (compare WEEL TWA)

The odour threshold is likely to be similar to that of chlorine, 0.3 ppm.
 Acute, subchronic, and chronic toxicity studies have shown no significant treatment related effects. High concentrations may produce moderate to

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 10 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

severe eye irritation, but not permanent injury. High doses also appear to be embryotoxic. Since nearly all sodium hypochlorite is handled as aqueous solution, airborne exposure is likely to be as an aerosol, or mist. Sodium hypochlorite dissociates in water to form free hypochlorous acid in equilibrium. The toxic effects are likely to be similar to those of chlorine or sodium hydroxide.

PERSONAL PROTECTION

Glasses:
Full face- shield.
Gloves:
PE/EVAL/PE Gloves.
Respirator:
Type B-P Filter of sufficient capacity

EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

Elbow length PVC gloves.
When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	B-1 P-	-
1000	50	-	B-1 P-
5000	50	Airline*	-
5000	100	-	B-2 P-
10000	100	-	B-3 P-
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 11 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.
Corrosive.
Alkaline.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Miscible
pH (1% solution): Not Available
Volatile Component (%vol): Not Available
Relative Vapor Density (air=1): Not Available
Lower Explosive Limit (%): Not Applicable
Autoignition Temp (°C): Not Applicable
State: Liquid

Boiling Range (°C): Not Available
Specific Gravity (water=1): 1.099
pH (as supplied): 13.3-13.9
Vapor Pressure (kPa): Not Available
Evaporation Rate: Not Available
Flash Point (°C): Not Applicable
Upper Explosive Limit (%): Not Applicable
Decomposition Temp (°C): Not Available

APPEARANCE

Clear alkaline liquid with a chlorine odor; mixes with water.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

Avoid strong acids.

Section 11 - TOXICOLOGICAL INFORMATION

Liquid Ammonia Test Solution #2

Not available. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 12 of 15
Section 11 - TOXICOLOGICAL INFORMATION

SODIUM HYDROXIDE:

TOXICITY

Skin (rabbit): 500 mg/24h SEVERE
Eye (rabbit): 0.05 mg/24h SEVERE
Eye(rabbit):1 mg/24h SEVERE
Eye(rabbit):1 mg/30s rinsed-SEVERE

IRRITATION

SODIUM HYPOCHLORITE:

TOXICITY

Oral (mouse) LD50: 5800 mg/kg
Oral (woman) TDLo: 1000 mg/kg
as sodium hypochlorite pentahydrate
Oral (rat) LD50: 8910 mg/kg
Eye (rabbit): 100 mg - moderate

IRRITATION

Eye (rabbit): 10 mg - Moderate

Skin (rabbit): 500 mg/24h-moderate

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

Section 12 - ECOLOGICAL INFORMATION

Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

SODIUM HYDROXIDE:

Toxicity Fish: LC50(96)43mg/L

SODIUM HYPOCHLORITE:

The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment)

Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards:

1993 Commission of the European Communities.

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralize at an approved treatment plant.
- Treatment should involve: Neutralization with suitable dilute acid followed

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

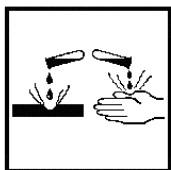
CHEMWATCH 4650-9
CD 2005/3 Page 13 of 15
Section 13 - DISPOSAL CONSIDERATIONS

by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material).
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
Puncture containers to prevent re-use and bury at an authorized landfill.

Section 14 - TRANSPORTATION INFORMATION

DOT Information
Shipping Name: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Hazard Class: 8
SubRisk: None
UN/NA Number: 3266
Packing Group: II
Labels Required: corrosive
Additional Shipping Information:
International Transport Regulations:
IMO: 3266

Section 15 - REGULATORY INFORMATION



RISK

Causes severe burns.
Risk of serious damage to eyes.
Harmful to aquatic organisms.

US Federal Regulations

A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

sodium hydroxide (1310-73-2, <10%)
CERCLA: final RQ = 1000 pounds (454 kg)

sodium hypochlorite (7681-52-9, <1%)
CERCLA: final RQ = 100 pounds (45.4 kg)

Component

TSCA

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 14 of 15
Section 15 - REGULATORY INFORMATION

sodium hydroxide Y
sodium hypochlorite Y

State Regulations

A. General Product Information

B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
sodium hydroxide	1310-73-2	Y	Y	Y	Y	Y	Y
sodium hypochlorite	7681-52-9	Y	N	Y	Y	N	Y

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

Other Regulations

A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

B. Component Information

CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS No	%	Min Conc.
sodium hydroxide	1310-73-2	<10	1% item 1442 (998)
sodium hypochlorite	7681-52-9	<1	1% item 1443 (1013)

All of this product's components are on the Canadian Domestic

REGULATIONS

sodium hydroxide (CAS: 1310-73-2) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US EPA Hazardous Substances

US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List

US CWA (Clean Water Act) - List of Hazardous Substances

US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances

US Minnesota Hazardous Substance List

US EPA High Production Volume Chemicals Additional List

US Food Additive Database

Canada Yukon Permissible Concentrations for Airborne Contaminant Substances

US Connecticut Hazardous Air Pollutants

Canadian Ingredient Disclosure List (SOR/88-64)

sodium hypochlorite (CAS: 7681-52-9) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List

US CWA (Clean Water Act) - List of Hazardous Substances

US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances

continued...

LIQUID AMMONIA TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-9
CD 2005/3 Page 15 of 15
Section 15 - REGULATORY INFORMATION

US Minnesota Hazardous Substance List
Canadian Ingredient Disclosure List (SOR/88-64)
US AIHA Workplace Environmental Exposure Levels (WEELs)
US Food Additive Database
US EPA Hazardous Substances
Canadian National Pollutant Release Inventory (NPRI)
US EPA High Production Volume Chemicals Additional List
sodium hypochlorite (CAS: 10022-70-5) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
US Minnesota Hazardous Substance List
Canadian Ingredient Disclosure List (SOR/88-64)
US DOE Temporary Emergency Exposure Limits (TEELs)
US AIHA Workplace Environmental Exposure Levels (WEELs)
US Food Additive Database
US EPA Hazardous Substances
Canadian National Pollutant Release Inventory (NPRI)
US EPA High Production Volume Chemicals Additional List

Section 16 - OTHER INFORMATION

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FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 1 of 15

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

SUPPLIER

Company: Aquarium Pharmaceuticals Inc
Address:
PO Box 218
Chalfont
PA, 18914- 0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

Company: Aquarium Pharmaceuticals Inc
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181
Fax: +1 215 822 1906

PRODUCT USE

Nitrate test solution for products 26, 34 and 401M.

SYNONYMS

"Solution ID# 3317"

Section 2 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS

None

EMERGENCY OVERVIEW

RISK

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE

Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 2 of 15
Section 2 - HAZARDS IDENTIFICATION

SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

Not normally a hazard due to non-volatile nature of product.

Inhalation hazard is increased at higher temperatures.

CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
polyethylene glycol	25322-68-3	<95
hydrochloric acid	7647-01-0	0.97

Section 4 - FIRST AID MEASURES

SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

EYE

If this product comes in contact with eyes:

- Wash out immediately with water.
- If irritation continues, seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin or hair contact occurs:

- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN

Treat symptomatically.

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 3 of 15

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable
Lower Explosive Limit (%): Not Applicable
Upper Explosive Limit (%): Not Applicable
Autoignition Temp (°F): Not Applicable

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon dioxide (CO₂), hydrogen chloride, other pyrolysis products typical of burning organic material, phosgene.

FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:
Safety Glasses.
Chemical goggles.
Gloves:
When handling larger quantities:
General purpose rubber glove.
Respirator:
Type B- P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 4 of 15

Section 6 - ACCIDENTAL RELEASE MEASURES

- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

DO NOT USE brass or copper containers / stirrers.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
 Jun-7-2007
 NB293ECP

CHEMWATCH 4650-16
 Version No:5
 CD 2007/2 Page 5 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Z	US OSHA Permissible Exposure Levels (PELs)										
	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)	TWA F/CC
Z1	Hydrogen chloride					5	7				
Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	
Canada - Saskatchewan Occupational Health and Safety Regulation	polyethylene glycol (Respirable size+)		3		6						
Canada - Saskatchewan Occupational Health and Safety Regulation	polyethylene glycol (Particulates, NOC++)		10		20						
Canada - British Columbia Occupational Exposure Limits	polyethylene glycol (Particles Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10								
US - Minnesota Permissible Exposure Limits (PELs)	hydrochloric acid (Hydrogen chloride)							5	7		
Canada - Ontario Occupational	hydrochloric acid (Hydrogen							2			

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
 Jun-7-2007
 NB293ECP

CHEMWATCH 4650-16
 Version No:5
 CD 2007/2 Page 6 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
al	chloride)							
Exposure								
Limits								
Canada -	hydrochlor					5	7, 5	
Quebec	ic acid							
Occupation	(Chlorure							
al	d'							
Exposure	hydrogène)							
Limits								
(French)								
US -	hydrochlor	(C)5	(C)7					
Vermont	ic acid							
Permissibl	(Hydrogen							
e Exposure	chloride)							
Limits								
Table Z-								
1- A								
Transition								
al Limits								
for Air								
Contaminan								
ts								
US -	hydrochlor					5	7	
Vermont	ic acid							
Permissibl	(Hydrogen							
e Exposure	chloride)							
Limits								
Table Z-								
1- A Final								
Rule								
Limits for								
Air								
Contaminan								
ts								
US -	hydrochlor					5	7	
Tennessee	ic acid							
Occupation	(Hydrogen							
al	chloride)							
Exposure								
Limits -								
Limits For								
Air								
Contaminan								
ts								
US -	hydrochlor					5	7	
California	ic acid							
Permissibl	(Hydrogen							
e Exposure	chloride;							
Limits for	muriatic							
Chemical	acid)							
Contaminan								
ts								
US - Idaho	hydrochlor					5	7	
- Limits	ic acid							
for Air	(Hydrogen							

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
 Jun-7-2007
 NB293ECP

CHEMWATCH 4650-16
 Version No:5
 CD 2007/2 Page 7 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Contaminants								
US - Hawaii Air Contaminant Limits	hydrochloric acid (Hydrogen chloride)					5	7	
US OSHA Permissible Exposure Levels (PELs) - Table Z1	hydrochloric acid (Hydrogen chloride)					5	7	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contaminant Limits	hydrochloric acid (Hydrogen chloride)						7.5	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	hydrochloric acid (Hydrogen chloride)	5	7	-	-			
US - Washington Permissible exposure limits of air contaminants	hydrochloric acid (Hydrogen chloride)					5.0		
Canada - Alberta Occupational Exposure Limits	hydrochloric acid (Hydrogen chloride)					5	7.5	
Canada - British Columbia Occupational Exposure Limits (Revised 2003))	hydrochloric acid (Hydrogen chloride)					2		
US NIOSH Recommended	hydrochloric acid					5	7	

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
 Jun-7-2007
 NB293ECP

CHEMWATCH 4650-16
 Version No:5
 CD 2007/2 Page 8 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
d Exposure Limits (RELS)	(Hydrogen chloride)							
US ACGIH Threshold Limit Values (TLV)	hydrochloric acid (Hydrogen chloride)					2		

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m ³)	Revised IDLH Value (ppm)
hydrochloric acid		50

ODOR SAFETY FACTOR (OSF)

OSF=1.3 (hydrochloric acid)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

MATERIAL DATA

INGREDIENT DATA

POLYETHYLENE GLYCOL:

For powdered forms:

The polyethylene glycols are extremely low in oral toxicity, are not significantly irritating to the eyes or skin, and are not absorbed through the skin in toxic amounts. vapour pressures are extremely low and inhalation exposure is limited to mists. Based on experimental data and human experience, these substances do not present significant hazards to health in the workplace.

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 9 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

HYDROCHLORIC ACID:

Odour Threshold Value: 0.262 ppm (detection), 10.06 ppm (recognition)

NOTE: Detector tubes for hydrochloric acid, measuring in excess of 1 ppm, are available commercially.

Hydrogen chloride is a strong irritant to the eyes, mucous membranes and skin. Chronic exposure produces a corrosive action on the teeth. Reports of respiratory irritation following short-term exposure at 5 ppm have led to the recommended TLV-C. There is no indication that skin contact with hydrogen chloride elicits systemic poisoning and a skin designation has not been applied.

Exposure of humans to hydrogen chloride at 50 to 100 ppm for 1 hour is reported to be barely tolerable; 35 ppm caused irritation of the throat on short exposure and 10 ppm was the maximal concentration for prolonged exposure. It has been stated that hydrogen chloride at concentrations of 5 ppm is immediately irritating.

-

Toxic effects of hydrochloric acid

Concentration

Clinical effects

0.067 - 0.267 ppm

Reported range of odour thresholds and

changes in respiratory pattern

5 ppm

No organic damage

10 ppm

Irritation; work undisturbed

10-50 ppm

Work difficult but possible

35 ppm

Short exposure irritation of the throat

50-100 ppm

Exposure for 1 h barely tolerable

1000-2000 ppm

Brief exposure dangerous; laryngospasm

1300-2000 ppm

Lethal after a few minutes

PERSONAL PROTECTION

EYE

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Wear general protective gloves, eg. light weight rubber gloves.

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet

Jun-7-2007

NB293ECP

CHEMWATCH 4650-16

Version No:5

CD 2007/2 Page 10 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

OTHER

No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	B- AUS P	-
1000	50	-	B- AUS P
5000	50	Airline *	-
5000	100	-	B- 2 P
10000	100	-	B- 3 P
	100+		Airline**

* - Continuous Flow

** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Molecular Weight: Not Applicable

Melting Range (°F): Not Available

Solubility in water (g/L): Miscible

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapor Density (air=1): Not Available

Lower Explosive Limit (%): Not Applicable

Autoignition Temp (°F): Not Applicable

State: Liquid

Boiling Range (°F): Not Available

Specific Gravity (water= 1): 1.128

pH (as supplied): Not Available

Vapor Pressure (mmHg): Not Available

Evaporation Rate: Not Available

Flash Point (°F): Not Applicable

Upper Explosive Limit (%): Not Applicable

Decomposition Temp (°F): Not Available

Viscosity: Not Available

APPEARANCE

Blue-green solution with no odour; mixes with water.

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 11 of 15

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

STORAGE INCOMPATIBILITY

Avoid contamination of water, foodstuffs, feed or seed.
Avoid reaction with oxidising agents.

Section 11 - TOXICOLOGICAL INFORMATION

Freshwater/Saltwater Nitrite Test Solution

TOXICITY AND IRRITATION

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

POLYETHYLENE GLYCOL:

TOXICITY

Oral (rat) LD50: 33750 mg/kg

for molecular weights (200-8000) *
Oral (rat) LD50: 31000->50000 mg/kg
Oral (mice) LD50: 38000->50000 mg/kg
Oral (g.pig) LD50: 17000->50000 mg/kg
Oral (rabbit) LD50: 14000->50000 mg/kg
Intraperitoneal (mice) LD50: 3100-12900 mg/kg

IRRITATION

Skin (rabbit): 500mg/24h - mild.
Eye (rabbit): 500mg/24h - mild.

* AIHA WEEL Guides

HYDROCHLORIC ACID:

TOXICITY

Unreported (man) LDLo: 81 mg/kg
Inhalation (human) LCLo: 1300 ppm/30 min
Inhalation (human) LCLo: 3000 ppm/5 min
Inhalation (rat) LC50: 3124 ppm/1h
Oral (rat) LD50: 900 mg/kg

IRRITATION

Eye (rabbit): 5mg/30s - Mild

The substance is classified by IARC as Group 3:
NOT classifiable as to its carcinogenicity to humans.
Evidence of carcinogenicity may be inadequate or limited in animal testing.

MATERIAL	CARCINOGEN	SENSITIZER	SKIN	MUTAGEN	REPROTOXIN
hydrochloric acid	ACGIH:A4				

CARCINOGEN

ACGIH: hydrochloric acid: A4

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 12 of 15

Section 12 - ECOLOGICAL INFORMATION

No data for Freshwater/Saltwater Nitrite Test Solution.
Refer to data for ingredients, which follows:

POLYETHYLENE GLYCOL:
BOD 5 if unstated: 0-0.02,1%
COD: 1.62-1.74,98%
Toxicity Fish: TLm(96)>10000mg/L

HYDROCHLORIC ACID:
Hazardous Air Pollutant: Yes
Fish LC50 (96hr.) (mg/l): 0.282

Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

Ecotoxicity

Fish LC100 (24 h): trout 10 mg/l

TLm (96 h): mosquito fish 282 ppm (fresh water)

LC50: goldfish 178 mg/l

Shrimp LC50 (48 h): 100 - 330 ppm (salt water)

Starfish LC50 (48 h): 100 - 330 mg/l

Cockle LC50 (48 h): 330 - 1000 mg/l

[Hach]

Hydrogen chloride in water dissociates almost completely, releasing hydrogen and chloride ions; the hydrogen ions are captured by water to produce hydronium ions.

Hydrochloric acid infiltrates soil, the rate dependent on moisture content. During soil transport, hydrochloric acid dissolves soil components.

Drinking water standard:

chloride: 400 mg/l (UK max.)

250 mg/l (WHO guideline)

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction,
- Reuse
- Recycling
- Disposal (if all else fails)

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 13 of 15
Section 13 - DISPOSAL CONSIDERATIONS

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA,
IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

US EPCRA Section 313 Chemical List For Reporting Year 2004

Ingredient	CAS	% de minimus concentration
hydrochloric acid	7647- 01- 0	1.0

US CERCLA List of Hazardous Substances and Reportable Quantities

Ingredient	CAS	RQ (Pounds)	RQ (KG)
hydrochloric acid	7647- 01- 0	5000	2270

polyethylene glycol (CAS: 25322-68-3) is found on the following regulatory lists;

- Canada - British Columbia Occupational Exposure Limits
- Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
- Canada Domestic Substances List (DSL)
- IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
- US - Minnesota Hazardous Substance List
- US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications
- US DOE Temporary Emergency Exposure Limits (TEELs)
- US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
- US EPA High Production Volume Program Chemical List
- US Food Additive Database
- US Premarket Notifications for Food Contact Substances
- US Toxic Substances Control Act (TSCA) - Inventory

hydrochloric acid (CAS: 7647-01-0) is found on the following regulatory lists;

- Canada - Alberta Ambient Air Quality Objectives
- Canada - Alberta Occupational Exposure Limits
- Canada - British Columbia Occupational Exposure Limits
- Canada - Ontario Occupational Exposure Limits
- Canada - Quebec Occupational Exposure Limits (French)
- Canada - Saskatchewan Industrial Hazardous Substances
- Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
- Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances
- Canada Controlled Drugs and Substances Act Schedule VI
- Canada Domestic Substances List (DSL)
- Canada Environmental Quality Guidelines (EQGs) Water: Community
- Canada Ingredient Disclosure List (SOR/88-64)
- Canada National Pollutant Release Inventory (NPRI)
- Canada Prohibited Toxic Substances - Schedule 2: Concentration Limits (French)

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet

Jun-7-2007

NB293ECP

CHEMWATCH 4650-16

Version No:5

CD 2007/2 Page 14 of 15

Section 15 - REGULATORY INFORMATION

Canada Prohibited Toxic Substances, Schedule 2, Concentration Limits (English)
CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Agency for Research on Cancer (IARC) Carcinogens
International Council of Chemical Associations (ICCA) - High Production Volume List
International Maritime Dangerous Goods Requirements (IMDG Code) - Goods Forbidden for Transport
Mexico Maximum Permissible Exposure Limits
OECD Representative List of High Production Volume (HPV) Chemicals
United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table II
US - Arizona Ambient Air Quality Guidelines
US - California Air Toxics "Hot Spots" List (Assembly Bill 2588) Substances for which emissions must be quantified
US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - California Toxic Air Contaminant List Category II
US - Connecticut Hazardous Air Pollutants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Minnesota Hazardous Substance List
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know Hazardous Substances
US - New Jersey Right to Know Hazardous Substances (Spanish)
US - Oregon Hazardous Materials
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wisconsin Hazardous Air Contaminants With Acceptable Ambient Concentrations
US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives
US ACGIH Carcinogens Listing
US ACGIH Threshold Limit Values (TLV)
US AIHA Emergency Response Planning Guides (ERPGs)
US CAA (Clean Air Act) 112 (r) List of Regulated Toxic & Flammable Substances and Threshold Quantities for Accidental Release Prevention
US CERCLA List of Hazardous Substances and Reportable Quantities
US Clean Air Act - Hazardous Air Pollutants
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides
US DOE Temporary Emergency Exposure Limits (TEELs)
US Drug Enforcement Administration (DEA) List II or Essential Chemicals
US Drug Enforcement Administration (DEA) Thresholds for Regulated Transactions in List II Chemicals
US EPA Acute Exposure Guideline Levels (AEGs) - Final
US EPA Hazardous Substances
US EPA High Production Volume Chemicals Additional List
US EPA High Production Volume Program Chemical List

continued...

FRESHWATER/SALTWATER NITRITE TEST SOLUTION

Chemwatch Material Safety Data Sheet
Jun-7-2007
NB293ECP

CHEMWATCH 4650-16
Version No:5
CD 2007/2 Page 15 of 15
Section 15 - REGULATORY INFORMATION

US EPA List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention
US EPCRA Section 313 Chemical List For Reporting Year 2004
US Food Additive Database
US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases
US NIOSH Recommended Exposure Limits (RELs)
US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US SARA Section 302 Extremely Hazardous Substances
US Toxic Substances Control Act (TSCA) - Inventory
WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

Section 16 - OTHER INFORMATION

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PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 1 of 16

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

PHOSPHATE TEST SOLUTION #1

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated
Address:
PO Box 218
Chalfont
PA, 18914-0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

PRODUCT USE

Phosphate test solution for product 63L.

SYNONYMS

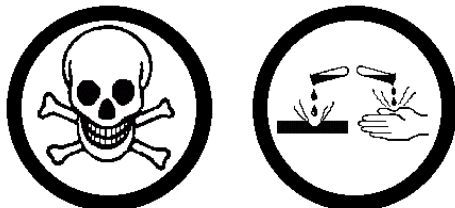
"Solution ID# 3352"

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
sulfuric acid	7664-93-9	45 ap.
ammonium heptamolybdate	12027-67-7	N/S

Section 3 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Toxic by inhalation.
Danger of cumulative effects.
Causes severe burns.
Risk of serious damage to eyes.

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 2 of 16
Section 3 - HAZARDS IDENTIFICATION

Possible cancer-causing agent following repeated inhalation*.

*(limited evidence)

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion. Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and esophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Swelling of the epiglottis may make it difficult to breathe which may result in suffocation. More severe exposure may result in vomiting blood and thick mucus, shock, abnormally low blood pressure, fluctuating pulse, shallow respiration and clammy skin, inflammation of stomach wall, and rupture of esophageal tissue. Untreated shock may eventually result in kidney failure. Severe cases may result in perforation of the stomach and abdominal cavity with consequent infection, rigidity and fever. There may be severe narrowing of the esophageal or pyloric sphincters; this may occur immediately or after a delay of weeks to years. There may be coma and convulsions, followed by death due to infection of the abdominal cavity, kidneys or lungs.

EYE

The material can produce severe chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating. If applied to the eyes, this material causes severe eye damage. Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possibly irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply opaque resulting in blindness.

SKIN

The material can produce severe chemical burns following direct contact with the skin. Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

If inhaled, this material can irritate the throat and lungs of some persons. Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Swelling of the lungs can occur, either immediately or after a delay; symptoms of this include chest tightness, shortness of breath, frothy phlegm and cyanosis. Lack of oxygen can cause death hours after onset. High concentrations cause inflamed airways and watery swelling of the lungs with edema.

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 3 of 16
Section 3 - HAZARDS IDENTIFICATION

CHRONIC HEALTH EFFECTS

On the basis of limited epidemiological or animal data, it has been concluded that prolonged inhalation of the material, in an occupational setting, may produce cancer in humans.

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Strong inorganic acid mists containing sulfuric acid can cause cancer. High levels of molybdenum can cause joint problems in the hands and feet with pain and lameness. Molybdenum compounds can also cause liver changes with elevated levels of enzymes and cause over-activity of the thyroid gland. A generalized feeling of unwellness can occur, with tiredness, weakness, diarrhea, loss of appetite and weight. Molybdenum has been associated with cancers of the airways, but on the other hand, a low intake of molybdenum may cause an increased risk of developing esophageal cancer.

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Center or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

EYE

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
- Transport to hospital, or doctor.

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 4 of 16
Section 4 - FIRST AID MEASURES

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

- For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
 - Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
 - Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
 - Strong acids produce a coagulation necrosis characterized by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralize the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralizing agents or any other additives. Several liters of saline are required.
 - Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
 - Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).
- [Ellenhorn and Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable
Lower Explosive Limit (%): Not Applicable
Upper Explosive Limit (%): Not Applicable
Autoignition Temp (°F): Not Applicable

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 5 of 16
Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 2625 feet in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
 - Not considered to be a significant fire risk.
 - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
 - Heating may cause expansion or decomposition leading to violent rupture of rigid containers.
 - May emit corrosive, poisonous fumes. May emit acrid smoke.
 - Non combustible.
 - Not considered to be a significant fire risk.
 - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
 - Heating may cause expansion or decomposition leading to violent rupture of rigid containers.
 - May emit acrid smoke. May emit corrosive and poisonous fumes.
- Decomposition may produce toxic fumes of, nitrogen oxides (NO_x), sulfur oxides (SO_x).

FIRE INCOMPATIBILITY

None known.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

continued...

PHOSPHATE TEST SOLUTION #1

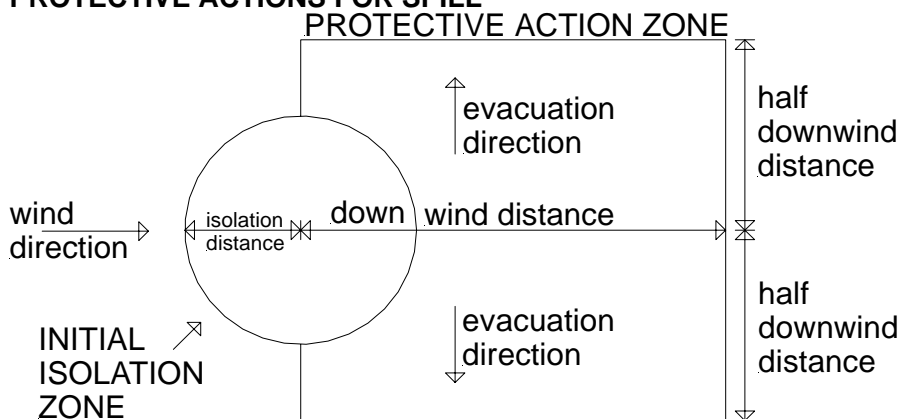
Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 6 of 16

Section 6 - ACCIDENTAL RELEASE MEASURES

- May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	25 meters
Downwind Protection Distance	250 meters

FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne"

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet

Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10

CD 2005/3 Page 7 of 16

Section 6 - ACCIDENTAL RELEASE MEASURES

compressed gas cylinder.

5 Guide 154 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGLE) (in ppm)

AEGLE 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGLE 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGLE 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

sulfuric acid 30 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

sulfuric acid 10 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

sulfuric acid 2 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

sulfuric acid 1 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1% Toxic (T) >= 3.0%

R50 >= 0.25% Corrosive (C) >= 5.0%

R51 >= 2.5%

else >= 10%

where percentage is percentage of ingredient found in the mixture

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 8 of 16
Section 7 - HANDLING AND STORAGE

- Use in a well-ventilated area.
 - WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
 - Avoid smoking, naked lights or ignition sources.
 - Avoid contact with incompatible materials.
 - When handling, DO NOT eat, drink or smoke.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately.
 - Launder contaminated clothing before re-use.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.

RECOMMENDED STORAGE METHODS

- DO NOT use aluminum or galvanized containers.
Check regularly for spills and leaks.
- Lined metal can, Lined metal pail/drum
 - Plastic pail
 - Polyliner drum
 - Packing as recommended by manufacturer.
 - Check all containers are clearly labeled and free from leaks.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)
Z1	Sulfuric acid		1							
Z1	Molybdenum (as Mo) - Soluble compounds		5							

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³
US California Permissible	Sulfuric acid	--	1	--	3		

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 9 of 16

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits for Chemical Contaminants					
US Minnesota Permissible Exposure Limits (PELs)	Sulfuric acid		1		
US Vermont Permissible Exposure Limits Table	Sulfuric acid		1		
Z-1-A Transitional Limits for Air Contaminants					
US Vermont Permissible Exposure Limits Table	Sulfuric acid		1		
Z-1-A Final Rule Limits for Air Contaminants					
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Sulfuric acid		1		
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Sulfuric acid		1		3
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Sulphuric acid	-	1	-	1
US Washington Permissible exposure limits of air contaminants	Sulfuric acid		1		3
Canadian British Columbia Occupational Exposure Limits	Sulfuric acid, Thoracic (Revised 2004)		0.2 (M)		
NIOSH Recommended Exposure Limits for Hazardous Agents in the Workplace	Sulfuric acid		1		
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Molybdenum (as Mo) - Total dust		10		
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Molybdenum (as Mo) - Soluble compounds	-	5	-	10
US Vermont Permissible Exposure Limits Table	Molybdenum (as Mo) - Total dust		10		
Z-1-A Final Rule Limits for Air Contaminants					
US Vermont Permissible Exposure Limits Table	Molybdenum (as Mo) - Total dust		15		
Z-1-A Transitional Limits for Air Contaminants					
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Molybdenum (as Mo) - Soluble compounds		5		
US Vermont Permissible Exposure Limits Table	Molybdenum (as Mo) - Soluble compounds		5		
Z-1-A Final Rule Limits for Air Contaminants					
US Vermont Permissible	Molybdenum (as		5		

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 10 of 16

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Mo) - Soluble compounds			
US California Permissible Exposure Limits for Chemical Contaminants	Molybdenum, soluble compounds, as Mo	--	5	
US Washington Permissible exposure limits of air contaminants	Molybdenum (as Mo) - Soluble compounds		5	10
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Molybdenum, (as Mo) - Soluble compounds		5	10
US Minnesota Permissible Exposure Limits (PELs)	Molybdenum (as Mo) - Soluble compounds		5	
Canadian British Columbia Occupational Exposure Limits	Molybdenum - Soluble compounds, as Mo, Respirable		0.5	
No data available:	ammonium heptamolybdate as (CAS: 12027-67-7)			

Not available. Refer to individual constituents.

INGREDIENT DATA

SULFURIC ACID:

NOTE: Detector tubes for sulfuric acid, measuring in excess of 1 mg/m³, are commercially available.

Based on controlled inhalation studies the TLV-TWA is thought to be protective against the significant risk of pulmonary irritation and incorporates a margin of safety so as to prevent injury to the skin and teeth seen in battery workers acclimatised to workplace concentrations of 16 mg/m³. Experimental evidence in normal unacclimated humans indicates the recognition, by all subjects, of odour, taste or irritation at 3 mg/m³ or 5 mg/m³. All subjects reported these levels to be objectionable but to varying degrees.

AMMONIUM HEPTAMOLYBDATE:

An increased incidence of non-specific symptoms including headache, weakness, fatigue, anorexia and joint and muscle weakness has been reported to occur in mining and metallurgy workers exposed to 60-600 mg (as Mo). Some investigators have attributed gout and elevated uric acid concentration found in some Armenians to result from exposures to Armenian soils rich in molybdenum, whilst exposure has been implicated as a cause of bone disease amongst Indians. "These involvements are speculative". [US National Research Council]. As far as it is known, the recommended TLV-TWA incorporates a large margin of safety against potential pulmonary or systemic effects.

PERSONAL PROTECTION

Glasses:

Full face- shield.

Gloves:

PE/EVAL/PE Gloves.

Respirator:

Type E-P Filter of sufficient capacity

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 11 of 16

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

Elbow length PVC gloves.
When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	E-1 P	-
1000	50	-	E-1 P
5000	50	Airline*	-
5000	100	-	E-2 P
10000	100	-	E-3 P
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 12 of 16

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.
Corrosive.
Acid.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Miscible
pH (1% solution): Not Available
Volatile Component (%vol): Not Available
Relative Vapor Density (air=1): Not Available
Lower Explosive Limit (%): Not Applicable
Autoignition Temp (°C): Not Applicable
State: Liquid

Boiling Range (°C): Not Available
Specific Gravity (water=1): 1.0
pH (as supplied): 0.9
Vapor Pressure (kPa): Not Available
Evaporation Rate: Not Available
Flash Point (°C): Not Applicable
Upper Explosive Limit (%): Not Applicable
Decomposition Temp (°C): Not Available

APPEARANCE

Clear yellow liquid; mixes with water.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

Contact with alkaline material liberates heat.
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts.
- Neutralisation can generate dangerously large amounts of heat in small spaces.
- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
- The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting "bumping" can spatter the acid.
- Inorganic acids react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.
- Inorganic acids can initiate the polymerisation of certain classes of organic compounds.
- Inorganic acids react with cyanide compounds to release gaseous hydrogen cyanide.
- Inorganic acids generate flammable and/or toxic gases in contact with dithiocarbamates, isocyanates, mercaptans, nitrides, nitriles, sulfides, and strong reducing agents. Additional gas-generating reactions occur with sulfites, nitrites, thiosulfates (to give H₂S and SO₃), dithionites (SO₂), and even

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 13 of 16

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

carbonates.
- Acids often catalyse (increase the rate of) chemical reactions.
Avoid strong bases.

Section 11 - TOXICOLOGICAL INFORMATION

Phosphate Test Solution #1

Not available. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects
of Chemical Substances

SULFURIC ACID:

TOXICITY

Oral (rat) LD50: 2140 mg/kg

Inhalation (rat) LC50: 510 mg/m³/2h

Inhalation (human) TClO: 3 mg/m³/24w

Occupational exposures to strong inorganic acid
mists of sulfuric acid:

WARNING: For inhalation exposure ONLY: This substance has been classified by the
IARC as Group 1: CARCINOGENIC TO HUMANS.

IRRITATION

Eye (rabbit): 1.38 mg SEVERE

Eye (rabbit): 5 mg/30sec SEVERE

AMMONIUM HEPTAMOLYBDATE:

No significant acute toxicological data identified in literature search.

MATERIAL	CARCINOGEN	SENSITIZER	SKIN	MUTAGEN	REPROTOXIN
Phosphate Test Solution #1					
sulfuric acid	Listed				
ammonium heptamolybdate	Listed				

CARCINOGEN

ACGIH: sulfuric acid: A2 (M)

CARCINOGEN

ACGIH: ammonium heptamolybdate: A3

Section 12 - ECOLOGICAL INFORMATION

Prevent, by any means available, spillage from entering drains or water
courses.

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

SULFURIC ACID:

DO NOT discharge into sewer or waterways.

Sulfuric acid is soluble in water and remains indefinitely in the
environment as sulfate.

Large discharges may contribute to the acidification of water and be fatal
to aquatic life and soil micro-organisms.

Large discharges may contribute to the acidification of effluent treatment
systems and injure sewage treatment organisms. [ICI UK]

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 14 of 16

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.
 - Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
 - Treat and neutralize at an approved treatment plant. Treatment should involve: Neutralization with soda-ash or soda-lime followed by:
 - Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material).
 - Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.
- Puncture containers to prevent re-use and bury at an authorized landfill.

Section 14 - TRANSPORTATION INFORMATION

DOT Information

Shipping Name: CORROSIVE LIQUID, N.O.S.

Hazard Class: 8

SubRisk: None

UN/NA Number: 1760

Packing Group: II

Labels Required: corrosive

Additional Shipping Information:

International Transport Regulations:

IMO: 1760

Section 15 - REGULATORY INFORMATION



RISK

Toxic by inhalation.
Danger of cumulative effects.
Causes severe burns.
Risk of serious damage to eyes.

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 15 of 16
Section 15 - REGULATORY INFORMATION

US Federal Regulations

A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

sulfuric acid (7664-93-9,45ap.%)
SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 1000 pounds (454 kg)

Component	TSCA
sulfuric acid	Y
ammonium heptamolybdate	Y

State Regulations

A. General Product Information

B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
sulfuric acid	7664-93-9	Y	Y	Y	Y	Y	Y
ammonium heptamolybdate	12027-67-7	N	N	N	N	N	N

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

Other Regulations

A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

B. Component Information

CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS No	%	Min Conc.
sulfuric acid	7664-93-9	45 ap.	1% item 1485 (138)
ammonium heptamolybdate	12027-67-7	N/S	1% item 809 (1164)

All of this product's components are on the Canadian Domestic

REGULATIONS

sulfuric acid (CAS: 7664-93-9) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US Californian Proposition 65 - Priority List for the Development of NSRLs for Carcinogens

US ACGIH Carcinogens Listing

continued...

PHOSPHATE TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-10
CD 2005/3 Page 16 of 16
Section 15 - REGULATORY INFORMATION

US SARA Section 302 Extremely Hazardous Substances
US EPA Hazardous Substances
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
US Minnesota Hazardous Substance List
US EPA High Production Volume Chemicals Additional List
US EPCRA Section 313 Chemical List For Reporting Year 2004
Canadian Ingredient Disclosure List (SOR/88-64)
US Food Additive Database
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
US Connecticut Hazardous Air Pollutants

ammonium heptamolybdate (CAS: 12027-67-7) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
Canadian Ingredient Disclosure List (SOR/88-64)
US DOE Temporary Emergency Exposure Limits (TEELs)
US California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Immune
US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory
US ACGIH Carcinogens Listing
US Connecticut Hazardous Air Pollutants
US Minnesota Hazardous Substance List
US California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List

Section 16 - OTHER INFORMATION

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

Issue Date: Mon 3-Oct-2005
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PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 1 of 12

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

PHOSPHATE TEST SOLUTION #2

STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR
1910.1200.**

SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated
Address:
PO Box 218
Chalfont
PA, 18914-0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

PRODUCT USE

Phosphate test solution for product 63L.

SYNONYMS

"Solution ID# 3311"

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
glycerol	56-81-5	>97
stannous chloride, anhydrous	7772-99-8	<3

Section 3 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Cumulative effects may result following exposure*.
May produce discomfort of the eyes and skin*.

*(limited evidence)

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 2 of 12
Section 3 - HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality (death) rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

EYE

There is some evidence to suggest that this material can cause eye irritation and damage in some persons. Limited evidence or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals. Prolonged eye contact may cause inflammation characterized by a temporary redness of the conjunctiva (similar to windburn).

SKIN

There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons. Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions. There is some evidence to suggest that the material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product.

CHRONIC HEALTH EFFECTS

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Glyceryl triesters (triglycerides), following ingestion, are metabolised to monoglycerides, free fatty acids and glycerol, all of which are absorbed in the intestinal mucosa and undergo further metabolism. Little or no acute, subchronic or chronic oral toxicity was seen in animal studies unless levels approached a significant percentage of calorific intake. Subcutaneous injections of tricapyrin in rats over a five-week period caused granulomatous reaction characterised by oil deposits surrounded by macrophages. Diets containing substantial levels of tributyrin produced gastric lesions in rats fed for 3-35 weeks; the irritative

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 3 of 12
Section 3 - HAZARDS IDENTIFICATION

effect of the substance was thought to be the cause of tissue damage. Dermal application was not associated with significant irritation in rabbit skin; ocular exposures were, at most, mildly irritating to rabbit eyes. No evidence of sensitisation or photosensitisation was seen in a guinea pig maximisation test. Most of the genotoxicity test systems were negative. Tricaprylin, trioctanoin and triolein have been used, historically, as vehicles in carcinogenicity testing of other chemicals. In one study, subcutaneous injection of tricapyrylin, in newborn mice, produced more tumours in lymphoid tissue than were seen in untreated animals whereas, in another study, subcutaneous or intraperitoneal injection in 4- to 6-week old female mice produced no tumours. Trioctanoin injected subcutaneously in hamster produced no tumours; when injected intraperitoneally in pregnant rats there was an increase in mammary tumours among the off-spring but similar studies in pregnant hamsters and rabbits showed no tumours in the off-spring. The National Toxicological Program conducted a 2-year study in rats given tricapyrylin by gavage. The treatment was associated with a statistically significant dose-related increase in pancreatic acinar cell hyperplasia and adenoma but there were no acinar carcinomas. Tricaprylin is not teratogenic to mice or rats but some reproductive effects were seen in rabbits. A low level of foetal eye abnormalities and a small percentage of abnormal sperm were reported in mice injected with trioctanoin. Chronic exposure to tin dusts and fume can result in substantial amounts being deposited in the lungs and result in reduced lung function and difficulty breathing.

Section 4 - FIRST AID MEASURES

SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - If pain persists or recurs seek medical attention.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear
 - Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN

Treat symptomatically.

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 4 of 12

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): 320 (CC) glycerol
Lower Explosive Limit (%): 0.9 glycerol
Upper Explosive Limit (%): Not Available
Autoignition Temp (°F): Not Available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
 - Slight fire hazard when exposed to heat or flame.
 - Heating may cause expansion or decomposition leading to violent rupture of containers.
 - On combustion, may emit toxic fumes of carbon monoxide (CO).
 - May emit acrid smoke.
 - Mists containing combustible materials may be explosive.
- Combustion products include, carbon dioxide (CO₂), hydrogen chloride, phosgene, other pyrolysis products typical of burning organic material.
May emit poisonous fumes.
May emit corrosive fumes.

FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Slippery when spilt.
- Remove all ignition sources.
 - Clean up all spills immediately.
 - Avoid breathing vapors and contact with skin and eyes.
 - Control personal contact by using protective equipment.
 - Contain and absorb spill with sand, earth, inert material or vermiculite.
 - Wipe up.
 - Place in a suitable labeled container for waste disposal.

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 5 of 12

Section 6 - ACCIDENTAL RELEASE MEASURES

MAJOR SPILLS

Slippery when spilt.

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources. Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

glycerol 500 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

glycerol 50 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

glycerol 30 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

glycerol 15 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 6 of 12

Section 6 - ACCIDENTAL RELEASE MEASURES

Very Toxic (T+) $\geq 0.1\%$	Toxic (T) $\geq 3.0\%$
R50 $\geq 0.25\%$	Corrosive (C) $\geq 5.0\%$
R51 $\geq 2.5\%$	
else $\geq 10\%$	

where percentage is percentage of ingredient found in the mixture

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.
 - Use in a well-ventilated area.
 - Prevent concentration in hollows and sumps.
 - DO NOT enter confined spaces until atmosphere has been checked.
 - Avoid smoking, naked lights or ignition sources.
 - Avoid contact with incompatible materials.
 - When handling, DO NOT eat, drink or smoke.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
- DO NOT allow clothing wet with material to stay in contact with skin.

RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)
Z1	Glycerin		15							

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 7 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³
Z1	(mist) - Total dust Glycerin (mist) - Respirable fraction	5					
US Minnesota Permissible Exposure Limits (PELs)	Glycerin (mist) - Total dust		10				
US Minnesota Permissible Exposure Limits (PELs)	Glycerin (mist) - Respirable fraction		5				
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Glycerin (mist) - Respirable fraction		5				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Glycerin (mist) - Total dust		10				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Glycerin (mist) - Respirable fraction		5				
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Glycerin (mist) - Total dust		10				
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Glycerin (mist) - Respirable fraction		5				
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Glycerin (mist) - Total dust		15				
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Glycerin mist		10		20		
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Glycerin mist		(See Table 11)				
US Washington Permissible exposure limits of air contaminants	Glycerin mist - Total particulate		10		20		
US Washington Permissible exposure limits of air contaminants	Glycerin mist - Respirable fraction		5		10		
Canadian British Columbia Occupational Exposure Limits	Glycerin - mist, Respirable		3				
Canadian British Columbia	Glycerin - mist		10				

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 8 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Tin oxide and inorganic compounds except SnH ₄ , (as Sn)	2	4
No data available:	stannous chloride, anhydrous as (CAS: 7772-99-8)		

Not available. Refer to individual constituents.

INGREDIENT DATA

GLYCEROL:

The mist is considered to be a nuisance particulate which appears to have little adverse effect on the lung and does produce significant organic disease or toxic effects. OSHA concluded that this limit would protect the worker from kidney damage and perhaps, testicular effects.

STANNOUS CHLORIDE, ANHYDROUS:

A TLV-TWA is recommended so as to minimize the risk of stannosis. The STEL (4.0 mg/m³) has been eliminated (since 1986) so that additional toxicological data and industrial hygiene experience may become available to provide a better base for quantifying on a toxicological basis what the STEL should in fact be.

PERSONAL PROTECTION

- Glasses:
Chemical goggles.
- Gloves:
PVC chemical resistant type.
- Respirator:
Type A-P Filter of sufficient capacity

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.
- Wear safety footwear or safety gumboots, eg. Rubber.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
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continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 9 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

1000	10	A-1 P	-
1000	50	-	A-1 P
5000	50	Airline*	-
5000	100	-	A-2 P
10000	100	-	A-3 P
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.

Molecular Weight: Not Applicable

Melting Range (°C): Not Available

Solubility in water (g/L): Not Applicable

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapor Density (air=1): Not Available

Lower Explosive Limit (%): 0.9 glycerol

Autoignition Temp (°C): Not Available

State: Liquid

Boiling Range (°C): Not Available

Specific Gravity (water=1): 1.262

pH (as supplied): Not Available

Vapor Pressure (kPa): Not Available

Evaporation Rate: Not Available

Flash Point (°C): 160 (CC) glycerol

Upper Explosive Limit (%): Not Available

Decomposition Temp (°C): Not Available

APPEARANCE

Clear colourless liquid with a mild odor; mixes with water.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 10 of 12

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

STORAGE INCOMPATIBILITY

Avoid reaction with oxidizing agents.

Section 11 - TOXICOLOGICAL INFORMATION

Phosphate Test Solution #2

Not available. Refer to individual constituents.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

GLYCEROL:

TOXICITY

Oral (Rat) LD50: 12600 mg/kg

IRRITATION

STANNOUS CHLORIDE, ANHYDROUS:

TOXICITY

Oral (rat) LD50: 700 mg/kg

IRRITATION

Nil reported

Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.
Refer to data for ingredients, which follows:

GLYCEROL:

Algae IC50 (72hr.) (mg/l): 2900-10000

log Kow (Sangster 1997): -1.76

log Pow (Verschueren 1983): 1.07692307

BOD5: 51%

COD: 95%

ThOD: 93%

log Kow : -2.66- -2.47

BOD 5 if unstated: 0.617-0.87,31-51%

COD : 1.16,82-95%

ThOD : 1.217-1.56

Completely biodegradable.

Fish LC50: >5000 mg/l

Algae IC50: >2900 mg/l

Bacteria EC50: .10000 mg/l (Pseudomonas putida)

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

Puncture containers to prevent re-use and bury at an authorized landfill.

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17
CD 2005/3 Page 11 of 12

Section 14 - TRANSPORTATION INFORMATION

DOT Information
Shipping Name: None
Hazard Class: None
SubRisk: None
UN/NA Number: None
Packing Group: None
Additional Shipping Information:
International Transport Regulations:
IMO: None

Section 15 - REGULATORY INFORMATION

RISK

US Federal Regulations

A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

None

Component TSCA
glycerol Y
stannous chloride, anhydrous Y

State Regulations

A. General Product Information

B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
glycerol	56-81-5	N	N	Y	Y	N	Y
stannous chloride, anhydrous	7772-99-8	N	N	Y	N	N	N

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

Other Regulations

A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

B. Component Information

CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

continued...

PHOSPHATE TEST SOLUTION #2

Chemwatch Material Safety Data Sheet

Issue Date: Thu 6-Oct-2005

CHEMWATCH 4650-17

CD 2005/3 Page 12 of 12

Section 15 - REGULATORY INFORMATION

Component	CAS No	%	Min Conc.
stannous chloride, anhydrous	7772-99-8	<3	1% item 1569 (496)

All of this product's components are on the Canadian Domestic

REGULATIONS

glycerol (CAS: 56-81-5) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US Minnesota Hazardous Substance List
US EPA High Production Volume Program Chemical List
US Food Additive Database
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
US Connecticut Hazardous Air Pollutants

stannous chloride, anhydrous (CAS: 7772-99-8) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US Food Additive Database
Canadian Ingredient Disclosure List (SOR/88-64)
US DOE Temporary Emergency Exposure Limits (TEELs)
US Wisconsin Hazardous Air Contaminants with Acceptable Ambient Concentrations
US ACGIH Carcinogens Listing
US EPA High Production Volume Program Chemical List
US Minnesota Hazardous Substance List
US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Inorganic and Organic Constituents 1
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List

Section 16 - OTHER INFORMATION

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

Issue Date: Thu 6-Oct-2005

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POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 1 of 12

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

POND CARE SALT LEVEL TEST SOLUTION #1

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated
Address:
PO Box 218
Chalfont
PA, 18914-0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

PRODUCT USE

Salt level test solution for product 163 and 164M.

SYNONYMS

"Solution ID# 3311"

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
glycerol	56-81-5	>99.5

Section 3 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Cumulative effects may result following exposure*.
May produce discomfort of the eyes and skin*.

*(limited evidence)

POTENTIAL HEALTH EFFECTS

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 2 of 12
Section 3 - HAZARDS IDENTIFICATION

ACUTE HEALTH EFFECTS

SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality (death) rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

EYE

There is some evidence to suggest that this material can cause eye irritation and damage in some persons. Limited evidence or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals. Prolonged eye contact may cause inflammation characterized by a temporary redness of the conjunctiva (similar to windburn).

SKIN

There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons. Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions. There is some evidence to suggest that the material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product.

CHRONIC HEALTH EFFECTS

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Glyceryl triesters (triglycerides), following ingestion, are metabolised to monoglycerides, free fatty acids and glycerol, all of which are absorbed in the intestinal mucosa and undergo further metabolism. Little or no acute, subchronic or chronic oral toxicity was seen in animal studies unless levels approached a significant percentage of calorific intake. Subcutaneous injections of tricaprilyn in rats over a five-week period caused granulomatous reaction characterised by oil deposits surrounded by macrophages. Diets containing substantial levels of tributyrin produced gastric lesions in rats fed for 3-35 weeks; the irritative effect of the substance was thought to be the cause of tissue damage. Dermal application was not associated with significant irritation in rabbit skin;

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 3 of 12
Section 3 - HAZARDS IDENTIFICATION

ocular exposures were, at most, mildly irritating to rabbit eyes. No evidence of sensitisation or photosensitisation was seen in a guinea pig maximisation test. Most of the genotoxicity test systems were negative. Tricaprylin, trioctanoin and triolein have been used, historically, as vehicles in carcinogenicity testing of other chemicals. In one study, subcutaneous injection of tricapyrylin, in newborn mice, produced more tumours in lymphoid tissue than were seen in untreated animals whereas, in another study, subcutaneous or intraperitoneal injection in 4- to 6-week old female mice produced no tumours. Trioctanoin injected subcutaneously in hamster produced no tumours; when injected intraperitoneally in pregnant rats there was an increase in mammary tumours among the off-spring but similar studies in pregnant hamsters and rabbits showed no tumours in the off-spring. The National Toxicological Program conducted a 2-year study in rats given tricapyrylin by gavage. The treatment was associated with a statistically significant dose-related increase in pancreatic acinar cell hyperplasia and adenoma but there were no acinar carcinomas. Tricaprylin is not teratogenic to mice or rats but some reproductive effects were seen in rabbits. A low level of foetal eye abnormalities and a small percentage of abnormal sperm were reported in mice injected with trioctanoin.

Section 4 - FIRST AID MEASURES

SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN

Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): 390.2 approx.
Lower Explosive Limit (%): Not Available
Upper Explosive Limit (%): Not Available

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 4 of 12
Section 5 - FIRE FIGHTING MEASURES

Autoignition Temp (°F): 698 approx.

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
 - Slight fire hazard when exposed to heat or flame.
 - Heating may cause expansion or decomposition leading to violent rupture of containers.
 - On combustion, may emit toxic fumes of carbon monoxide (CO).
 - May emit acrid smoke.
 - Mists containing combustible materials may be explosive.
- Combustion products include, carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.
May emit corrosive fumes.

FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

Slippery when spilt.

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

Slippery when spilt.

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 5 of 12

Section 6 - ACCIDENTAL RELEASE MEASURES

- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources. Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGLE) (in ppm)

AEGLE 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGLE 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGLE 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

glycerol 500 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

glycerol 50 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

glycerol 30 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

glycerol 15 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 6 of 12

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.
 - Use in a well-ventilated area.
 - Prevent concentration in hollows and sumps.
 - DO NOT enter confined spaces until atmosphere has been checked.
 - Avoid smoking, naked lights or ignition sources.
 - Avoid contact with incompatible materials.
 - When handling, DO NOT eat, drink or smoke.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
- DO NOT allow clothing wet with material to stay in contact with skin.

RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)
Z1	Glycerin (mist) - Total dust		15							
Z1	Glycerin (mist) - Respirable fraction		5							

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
 Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
 CD 2005/3 Page 7 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³
US Minnesota Permissible Exposure Limits (PELs)	Glycerin (mist) - Total dust		10				
US Minnesota Permissible Exposure Limits (PELs)	Glycerin (mist) - Respirable fraction		5				
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Glycerin (mist) - Respirable fraction		5				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Glycerin (mist) - Total dust		10				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Glycerin (mist) - Respirable fraction		5				
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Glycerin (mist) - Total dust		10				
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Glycerin (mist) - Respirable fraction		5				
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Glycerin (mist) - Total dust		15				
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Glycerin mist		10		20		
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Glycerin mist		(See Table 11)				
US Washington Permissible exposure limits of air contaminants	Glycerin mist - Total particulate		10		20		
US Washington Permissible exposure limits of air contaminants	Glycerin mist - Respirable fraction		5		10		
Canadian British Columbia Occupational Exposure Limits	Glycerin - mist, Respirable		3				
Canadian British Columbia Occupational Exposure Limits	Glycerin - mist		10				

Not available. Refer to individual constituents.

INGREDIENT DATA

GLYCEROL:

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 8 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

The mist is considered to be a nuisance particulate which appears to have little adverse effect on the lung and does produce significant organic disease or toxic effects. OSHA concluded that this limit would protect the worker from kidney damage and perhaps, testicular effects.

PERSONAL PROTECTION

Glasses:
Chemical goggles.
Gloves:
PVC chemical resistant type.
Respirator:
Type A-P Filter of sufficient capacity

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

HANDS/FEET

Wear chemical protective gloves, eg. PVC.
Wear safety footwear or safety gumboots, eg. Rubber.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	A-1 P	-
1000	50	-	A-1 P
5000	50	Airline*	-
5000	100	-	A-2 P
10000	100	-	A-3 P
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 9 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Miscible
pH (1% solution): Not Available
Volatile Component (%vol): Not Available
Relative Vapor Density (air=1): 3.1 approx.
Lower Explosive Limit (%): Not Available
Autoignition Temp (°C): 370 approx.
State: Liquid

Boiling Range (°C): 290 approx.
Specific Gravity (water=1): 1.249
pH (as supplied): Not Available
Vapor Pressure (kPa): <0.133 @ 20 deg C
Evaporation Rate: Not Available
Flash Point (°C): 199 approx.
Upper Explosive Limit (%): Not Available
Decomposition Temp (°C): Not Available

APPEARANCE

Translucent liquid; mixes with water.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidizing agents.

Section 11 - TOXICOLOGICAL INFORMATION

Pond Care Salt Level Test Solution #1

Not available. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects
of Chemical Substances

GLYCEROL:
TOXICITY

Oral (Rat) LD50: 12600 mg/kg

IRRITATION

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 10 of 12

Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.
Refer to data for ingredients, which follows:

GLYCEROL:

Algae IC50 (72hr.) (mg/l): 2900-10000
log Kow (Sangster 1997): -1.76
log Pow (Verschueren 1983): 1.07692307
BOD5: 51%
COD: 95%
ThOD: 93%

log Kow : -2.66- -2.47
BOD 5 if unstated: 0.617-0.87,31-51%
COD : 1.16,82-95%
ThOD : 1.217-1.56
Completely biodegradable.
Fish LC50: >5000 mg/l
Algae IC50: >2900 mg/l
Bacteria EC50: .10000 mg/l (Pseudomonas putida)

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
Puncture containers to prevent re-use and bury at an authorized landfill.

Section 14 - TRANSPORTATION INFORMATION

DOT Information
Shipping Name: None
Hazard Class: None
SubRisk: None
UN/NA Number: None
Packing Group: None
Additional Shipping Information:
International Transport Regulations:
IMO: None

Section 15 - REGULATORY INFORMATION

RISK

US Federal Regulations

A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

continued...

POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 11 of 12
Section 15 - REGULATORY INFORMATION

B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

None

Component TSCA
glycerol Y

State Regulations

A. General Product Information

B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
glycerol	56-81-5	N	N	Y	Y	N	Y

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

Other Regulations

A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

B. Component Information

CANADA

All of this product's components are on the Canadian Domestic

REGULATIONS

glycerol (CAS: 56-81-5) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US Minnesota Hazardous Substance List

US EPA High Production Volume Program Chemical List

US Food Additive Database

Canada Yukon Permissible Concentrations for Airborne Contaminant Substances

US Connecticut Hazardous Air Pollutants

Section 16 - OTHER INFORMATION

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

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POND CARE SALT LEVEL TEST SOLUTION #1

Chemwatch Material Safety Data Sheet
Issue Date: Mon 3-Oct-2005

CHEMWATCH 4650-18
CD 2005/3 Page 12 of 12
Section 16 - OTHER INFORMATION

CHEMWATCH. TEL (+61 3) 9572 4700.

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 1 of 18

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

POND CARE SALT LEVEL TEST SOLUTION #2

STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR
1910.1200.**

SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated
Address:
PO Box 218
Chalfont
PA, 18914-0218
USA
Telephone: +1 215 822 8181
Emergency Tel: +1800 222 1222 (US Only)

PRODUCT USE

Salt level test for product 163 and 164M.

SYNONYMS

"Solution ID# 3312"

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
mercuric nitrate acid, as	10045-94-0	1-5
nitric acid	7697-37-2	<3
water	7732-18-5	>90

Section 3 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Very toxic if swallowed.
Danger of cumulative effects.

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 2 of 18
Section 3 - HAZARDS IDENTIFICATION

Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
Toxic by inhalation and in contact with skin.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
May possibly be harmful to the fetus/ embryo*.

*(limited evidence)

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
Severely toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 5 gram may be fatal or may produce serious damage to the health of the individual.
Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.

EYE

Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

SKIN

Skin contact with the material may be harmful; systemic effects may result following absorption.
The material is not thought to be a skin irritant (as classified using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
Skin contact with the material may produce toxic effects; systemic effects may result following absorption.
Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

Harmful by inhalation.
Toxic by inhalation.
The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects.

CHRONIC HEALTH EFFECTS

This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. This has been demonstrated via both short- and long-term experimentation. Substance accumulation, in the human body, is likely and may cause some concern

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 3 of 18
Section 3 - HAZARDS IDENTIFICATION

following repeated or long-term occupational exposure. Mercury easily crosses the placenta and causes birth defects. Chronic exposure results in excess saliva production, loss of appetite, stomach upset, vague abdominal discomfort and mild diarrhea. The kidneys are rarely involved. Chronic mercury poisoning usually shows itself mainly as effects on the nervous system, especially the central nervous system. There may be tremors involving the hands and fingers, eyelids, cheeks, legs and tongue. Motor control may be impaired, leading to slurred or scanning speech and inco-ordinated walking. Disturbance with seeing or hearing may occur. There may be behavior changes such as depression, despondency and fearfulness, often accompanied by sleep disturbance, headache and fatigue. Advanced cases show memory loss, hallucinations and deterioration in mental function. Other symptoms include a constant metallic taste, and various levels of gum inflammation, leading to periodontal disease and loosening of teeth. A dark blue line may occur along the gum margins. Uncommonly, a syndrome known as acrodynia ("pink disease") may occur, of which the major symptom is itchy scaling of the hands and feet.

Section 4 - FIRST AID MEASURES

SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
 - Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
 - For advice, contact a Poisons Information Center or a doctor.
 - Urgent hospital treatment is likely to be needed.
 - If conscious, give water to drink.
 - INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- NOTE: Wear a protective glove when inducing vomiting by mechanical means.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
 - If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
 - If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

EYE

- If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
 - Transport to hospital or doctor without delay.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin or hair contact occurs:
- Quickly but gently, wipe material off skin with a dry, clean cloth.

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 4 of 18
Section 4 - FIRST AID MEASURES

- Immediately remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
- Transport to hospital, or doctor.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

Treat symptomatically.

- Moderate adsorption of inorganic mercury compounds through the gastro-intestinal tract (7-15%) is the principal cause of poisoning. These compounds are highly concentrated (as the mercuric (Hg (2+) form) in the kidney; acute ingestion may lead to oliguric renal failure. Severe mucosal necrosis may also result from ingestion.
- Chronic effects range from proteinuria to nephrotic syndrome. Chronic presentation also involves dermatitis, gingivitis, stomatitis, tremor and neuropsychiatric symptoms of erethism.
- Absorbed inorganic mercury does not significantly cross the blood-brain barrier.
- Emesis and lavage should be initiated following acute ingestion.
- Activated charcoal interrupts absorption; cathartics should be administered when charcoal is given.
- The use of British Anti-Lewisite is indicated in severe inorganic poisoning. Newer derivatives of BAL (e.g. dimercaptosuccinic acid, [DMSA] and 2,3-dimercaptopropane-1-sulfonate [DMPS]) may prove more effective. [Ellenhorn and Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens from a healthy worker exposed at the Exposure Standard (ES or TLV).

Determinant	Index	Sampling Time	Comments
1. Total inorganic mercury in urine	35 ug/gm	Preshift	B
2. Total inorganic mercury in blood	15 ug/L	End of shift at end of workweek	B

B: Background levels occur in specimens collected from subjects NOT exposed. for poisons (where specific treatment regime is absent):

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for pulmonary edema .

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 5 of 18
Section 4 - FIRST AID MEASURES

- Monitor and treat, where necessary, for shock.
- Anticipate seizures .
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
 - Positive-pressure ventilation using a bag-valve mask might be of use.
 - Monitor and treat, where necessary, for arrhythmias.
 - Start an IV D5W TKO. If signs of hypovolemia are present use lactated Ringers solution. Fluid overload might create complications.
 - Drug therapy should be considered for pulmonary edema.
 - Hypotension with signs of hypovolemia requires the cautious administration of fluids. Fluid overload might create complications.
 - Treat seizures with diazepam.
 - Proparacaine hydrochloride should be used to assist eye irrigation.
- BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Not Applicable
Lower Explosive Limit (%): Not Applicable
Upper Explosive Limit (%): Not Applicable
Autoignition Temp (°F): Not Applicable

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

Decomposition may produce toxic fumes of, nitrogen oxides (NOx), mercury vapour / mercury metal.

FIRE INCOMPATIBILITY

None known.

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 6 of 18

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL Type	5 min	10 min	30 min	60 min	4 hr	8 hr
AEGL 1		0.53	0.53	0.53	0.53	0.53
AEGL 2		43	30	24	6	3
AEGL 3		170	120	92	23	11

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

mercuric nitrate	15 mg/m ³
water	500 mg/m ³

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 7 of 18

Section 6 - ACCIDENTAL RELEASE MEASURES

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

mercuric nitrate	0.15 mg/m ³
water	500 mg/m ³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

mercuric nitrate	0.15 mg/m ³
water	500 mg/m ³

The threshold concentration below which most people will experience no appreciable risk of health effects:

mercuric nitrate	0.04 mg/m ³
water	500 mg/m ³

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

RECOMMENDED STORAGE METHODS

- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 8 of 18
Section 7 - HANDLING AND STORAGE

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)
Z2	Cadmium dust(b)		0.2							
Z2	Cadmium fume(b)		0.1							
Z1	Nitric acid	2	5							

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³
Canadian British Columbia Occupational Exposure Limits	Cadmium and compounds, as Cd		0.01				
Canadian British Columbia Occupational Exposure Limits	Cadmium and compounds, Respirable, as Cd		0.002				
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Cadmium dust (as Cd)		0.2				0.6
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Cadmium, elemental and compounds, (as Cd)		0.02		0.06		
Canadian British Columbia Occupational Exposure Limits	Mercury - Inorganic compounds, as Hg		0.025				
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Mercury, (as Hg) - Inorganic forms, including metallic mercury		0.025		0.075		
US California Permissible Exposure Limits for Chemical Contaminants	Mercury, metallic and inorganic compounds as Hg	--	0.025				0.1
Canada Yukon Permissible	Mercury (all	-	0.05	-	0.15		

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 9 of 18

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Concentrations for Airborne Contaminant Substances	forms except Alkyl) (as Hg)				
US California Permissible Exposure Limits for Chemical Contaminants	Nitric acid	2	5	4	10
US Minnesota Permissible Exposure Limits (PELs)	Nitric acid	2	5	4	10
US Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	Nitric acid	2	5		
US Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	Nitric acid	2	5	4	10
US Tennessee Occupational Exposure Limits - Limits For Air Contaminants	Nitric acid	2	5	4	10
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Nitric acid		5.2		10.4
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances	Nitric acid	2	5	4	10
US Washington Permissible exposure limits of air contaminants	Nitric acid	2		4	
Canadian British Columbia Occupational Exposure Limits	Nitric acid	2		4	
NIOSH Recommended Exposure Limits for Hazardous Agents in the Workplace	Nitric acid	2		4	
No data available:	mercuric nitrate as (CAS: 10045-94-0) / (CAS: 7783-34-8) / (CAS: 13465-31-1)				
No data available:	water as (CAS: 7732-18-5)				

Not available. Refer to individual constituents.

INGREDIENT DATA

MERCURIC NITRATE:

NOTE: This substance has been classified by the ACGIH as A4 NOT classifiable as a Human Carcinogen Some jurisdiction require that health surveillance be conducted on occupationally exposed workers.

Such surveillance should emphasize

- demography, occupational and medical history and advice
- physical examination with emphasis on neurological, renal and gastrointestinal systems and skin
- urinary inorganic mercury.

NITRIC ACID:

Odour Threshold Value: 0.27 ppm (detection)

NOTE: Detector tubes for nitric acid, measuring in excess of 5 ppm,

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 10 of 18

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

are commercially available.

The TLV-TWA is protective against corrosion of the skin, tissue and other membranes, against irritation to the eyes and mucous membranes, and against acute pulmonary oedema or chronic obstructive lung disease. It is not clear whether the TLV-TWA and STEL values will prevent potentiation of the toxicity of inhaled nitrogen dioxide.

WATER:

No exposure limits set by NOHSC or ACGIH.

PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

PVC chemical resistant type.

Respirator:

Type E-P Filter of sufficient capacity

EYE

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

OTHER

- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	E-1 P	-
1000	50	-	E-1 P
5000	50	Airline*	-
5000	100	-	E-2 P
10000	100	-	E-3 P
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 11 of 18

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.
Mixes with water.
Toxic or noxious vapors/ gas.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Miscible
pH (1% solution): Not Available
Volatile Component (%vol): Not Available
Relative Vapor Density (air=1): Not Available
Lower Explosive Limit (%): Not Applicable
Autoignition Temp (°C): Not Applicable
State: Liquid

Boiling Range (°C): Not Available
Specific Gravity (water=1): 1.037
pH (as supplied): 0.5-0.8
Vapor Pressure (kPa): Not Available
Evaporation Rate: Not Available
Flash Point (°C): Not Applicable
Upper Explosive Limit (%): Not Applicable
Decomposition Temp (°C): Not Available

APPEARANCE

Colourless acidic liquid with no odor; mixes with water.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

None known.

Section 11 - TOXICOLOGICAL INFORMATION

Pond Care Salt Level Test Solution #2

Not available. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 12 of 18

Section 11 - TOXICOLOGICAL INFORMATION

MERCURIC NITRATE:

TOXICITY

Oral (rat) LD50: 26 mg/kg
Skin (rabbit) LD50: 75 mg/kg

IRRITATION

Nil Reported

NITRIC ACID:

TOXICITY

Oral (human) LDLo: 430 mg/kg
Inhalation (rat) LC50: 2500 ppm/1h *
Oral (?) LD50: 50-500 mg/kg *
Unreported (man) LDLo: 110 mg/kg
[Various Manufacturers]

IRRITATION

Nil Reported

* DuPont

WATER:

TOXICITY

No significant acute toxicological data identified in literature search.

IRRITATION

MATERIAL

CARCINOGEN

SENSITIZER

SKIN

MUTAGEN

REPROTOXIN

Pond Care Salt Level Test
Solution #2
mercuric nitrate
nitric acid
water

Listed

Yes

Yes

Yes

CARCINOGEN

ACGIH: mercuric nitrate: A4

SKIN

ACGIH: mercuric nitrate: Skin

MUTAGEN

German TRGS 905: mercuric nitrate:

REPROTOXIN

Californian Proposition 65 - Reproductive Toxicity:

TYPE: mercuric nitrate: developmental

DATE LISTED: July 1, 1990

Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

MERCURIC NITRATE:

Mercury may occur in the environment as free mercury, Hg⁰, mercury ions in salts and complexes, Hg⁺ and Hg²⁺ and as organic mercury compounds. Each species has its own set of physical, chemical and toxicologic properties.

In natural systems a dynamic equilibrium between soil and water mercury occurs determined largely by the physicochemical and biological conditions which pertain. Mercury ion is transported to aquatic ecosystems via surface run-off and from the atmosphere. It is complexed or tightly bound to both inorganic and organic particles, particularly sediments with high sulfur content. Organic acids such as fulvic and humic acids are often associated with mercury not bound to particles. Methyl mercury is produced by sediment micro-organisms, nonbiologically in sediments and by certain species of fish. The methylation of mercury by micro-organisms is the detoxification response that allows the organism to dispose of the heavy metal ions as small organometallic complexes. Methylation occurs only within a narrow pH range in which the micro-organism might exist and the rate of synthesis depends on the redox potential,

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 13 of 18
Section 12 - ECOLOGICAL INFORMATION

composition of the microbial population, availability of Hg^{2+} and temperature. Vitamin B12 derivatives are thought to be the methylating agents, because they are the only methyl carbanion- or methyl radical-donating coenzymes known. In addition it has been demonstrated that the livers of yellow-fin tuna and albacore produce methyl mercury from mercuric ion. Conversion of inorganic mercury to methyl mercury results in its desorption at relatively high rates thus little methyl mercury is found in sediments. Demethylation by sediment micro-organisms also occurs at a rapid rate compared with methylation. The best conversion rate for inorganic mercury to methyl mercury under ideal conditions is less than 1.5% per month.

Methyl mercury released into surface waters may also undergo photodecomposition into mercury. Methyl mercury can be bioaccumulated by planktonic algae and fish. In fish, the rate of absorption of methyl mercury is faster than that of inorganic mercury and the clearance rate is slower resulting in high concentrations of methyl mercury in muscle tissue. The ratio of organic mercury to total mercury is generally high in fish compared with other aquatic organisms. Selenium which is also present in seawater and other seafoods readily complexes with methyl mercury and is thought to have a protective effect against the toxic action of methyl mercury. The danger of methyl mercury poisoning has been illustrated in Minimata, Japan in the late 1950s following industrial release of mercury into the bay which subsequently resulted in at least 1200 cases of poisoning, some fatal.

The nitrates are of environmental concern because of their high water solubility and consequent leaching, diffusion, and environmental mobility in soil and water. Nitrate can contaminate groundwater to unacceptable levels. Nitrite is formed from nitrate or ammonium ion by micro-organisms in soil, water, sewage and the alimentary tract. The concern with nitrate in the environment is related to its conversion to nitrite.

Methaemoglobinaemia is caused following exposure to high levels of nitrite and produces difficulties in oxygen transport in the blood. Thousands of cases involving poisoning of infants, particularly in rural areas, have been reported as a result of drinking nitrate rich well-water.

Other concerns deriving from exposure to environmental nitrates relate to the production of nitrosamines following the reaction of food nitrites and secondary amines. Other nitroso-compounds may result following reaction with nitrites and amides, ureas, carbamates and other nitrogenous compounds. Nitrosamines produce liver damage, hemorrhagic lung lesions, convulsions and coma in rats, and teratogenic effects in experimental animals.

The N-nitroso class of compounds include potent carcinogens and mutagens: induction of tumors by single doses of N-nitroso compounds testify to this.

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Toxicity characteristic: use EPA hazardous waste number D009 (waste code E) if this substance, in a solid waste, produces an extract containing greater than 0.2 mg/L of mercury.

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

Puncture containers to prevent re-use and bury at an authorized landfill.

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 14 of 18

Section 14 - TRANSPORTATION INFORMATION

DOT Information
Shipping Name: None
Hazard Class: None
SubRisk: None
UN/NA Number: None
Packing Group: None
Additional Shipping Information:
International Transport Regulations:
IMO: None

Section 15 - REGULATORY INFORMATION



RISK

Toxic by inhalation and in contact with skin.
Very toxic if swallowed.
Danger of cumulative effects.
Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

US Federal Regulations

A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A) SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

mercuric nitrate (10045-94-0, 1-5%)
CERCLA: final RQ = 10 pounds (4.54 kg)

nitric acid (7697-37-2, %)
SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 1000 pounds (454 kg)

Component	TSCA
mercuric nitrate	Y
nitric acid	Y

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 15 of 18
Section 15 - REGULATORY INFORMATION

State Regulations

A. General Product Information

B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
mercuric nitrate	10045-94-0	N	N	Y	N	N	Y
nitric acid	7697-37-2	Y	Y	Y	Y	Y	Y

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

Other Regulations

A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

B. Component Information

CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS No	%	Min Conc.
mercuric nitrate	10045-94-0	1-5	1% item 983 (1216)
nitric acid	7697-37-2		1% item 1146 (111)

All of this product's components are on the Canadian Domestic

REGULATIONS

mercuric nitrate (CAS: 10045-94-0) is found on the following regulatory lists

- Canadian Domestic Substances List (DSL)
- US Toxic Substances Control Act (TSCA)
- US EPA Hazardous Substances
- US CWA (Clean Water Act) - List of Hazardous Substances
- US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
- Canadian Ingredient Disclosure List (SOR/88-64)
- US EPCRA Section 313 Chemical List For Reporting Year 2004
- US DOE Temporary Emergency Exposure Limits (TEELs)
- US California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Immune
- US ACGIH Carcinogens Listing
- Canada ARET (Accelerated Reduction / Elimination of Toxics) Substance List
- US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory
- Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
- US Wisconsin Hazardous Air Contaminants With Acceptable Ambient Concentrations Based on the US EPA's Reference Concentration Methodology
- Canada Transport Dangerous Goods - Schedule 3
- Canadian British Columbia Occupational Exposure Limits - Reprotoxins
- US Connecticut Hazardous Air Pollutants
- Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
- US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
- US Californian Proposition 65 - Reproductive Toxicity

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 16 of 18
Section 15 - REGULATORY INFORMATION

US California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values
US Department of Transportation (DOT) Marine Pollutants - Appendix B
mercuric nitrate (CAS: 7783-34-8) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US EPA Hazardous Substances
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
Canadian Ingredient Disclosure List (SOR/88-64)
US EPCRA Section 313 Chemical List For Reporting Year 2004
US DOE Temporary Emergency Exposure Limits (TEELs)
US California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Immune
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory
US California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values
US Department of Transportation (DOT) Marine Pollutants - Appendix B
US Californian Proposition 65 - Reproductive Toxicity
US ACGIH Carcinogens Listing
Canada ARET (Accelerated Reduction / Elimination of Toxics) Substance List
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
US Wisconsin Hazardous Air Contaminants With Acceptable Ambient Concentrations Based on the US EPA's Reference Concentration Methodology
Canada Transport Dangerous Goods - Schedule 3
Canadian British Columbia Occupational Exposure Limits - Reprotoxins
US Connecticut Hazardous Air Pollutants
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
mercuric nitrate (CAS: 13465-31-1) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US EPA Hazardous Substances
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
Canadian Ingredient Disclosure List (SOR/88-64)
US EPCRA Section 313 Chemical List For Reporting Year 2004
US DOE Temporary Emergency Exposure Limits (TEELs)
US California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Immune
Canada ARET (Accelerated Reduction / Elimination of Toxics) Substance List
US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory
US Wisconsin Hazardous Air Contaminants With Acceptable Ambient Concentrations Based on the US EPA's Reference Concentration Methodology
Canada Transport Dangerous Goods - Schedule 3
Canadian British Columbia Occupational Exposure Limits - Reprotoxins
US Connecticut Hazardous Air Pollutants
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 17 of 18
Section 15 - REGULATORY INFORMATION

US ACGIH Carcinogens Listing
US Californian Proposition 65 - Carcinogens
US National Toxicology Program (NTP) 11th Report Part A Known to be Human Carcinogens
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US Californian Proposition 65 - Reproductive Toxicity
US California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Respiratory
US California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values
US Department of Transportation (DOT) Marine Pollutants - Appendix B

nitric acid (CAS: 7697-37-2) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US SARA Section 302 Extremely Hazardous Substances
US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives
US EPA Hazardous Substances
US California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
US Minnesota Hazardous Substance List
US Oregon Hazardous Materials
US EPA High Production Volume Chemicals Additional List
US EPCRA Section 313 Chemical List For Reporting Year 2004
Canadian Ingredient Disclosure List (SOR/88-64)
US EPA List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention
Canada Yukon Permissible Concentrations for Airborne Contaminant Substances
US Connecticut Hazardous Air Pollutants
Canada Quebec Occupational Exposure Limits
US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

water (CAS: 7732-18-5) is found on the following regulatory lists
Canadian Domestic Substances List (DSL)
US Toxic Substances Control Act (TSCA)
US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory
US DOE Temporary Emergency Exposure Limits (TEELs)
US Californian Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity

Section 16 - OTHER INFORMATION

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages

continued...

POND CARE SALT LEVEL TEST SOLUTION #2

Chemwatch Material Safety Data Sheet
Issue Date: Tue 4-Oct-2005

CHEMWATCH 4650-35
CD 2005/3 Page 18 of 18
Section 16 - OTHER INFORMATION

resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

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